Cerrophidion wilsoni Jadin, Townsend, Castoe, and Campbell, 2012. The Honduran Montane Pitviper is a priority one species with an EVS of 15, placing it in the high vulnerability category (see this paper). This pitviper is distributed primarily in lower montane rainforest at elevations from 1,400 to 3,491 m, but can occur peripherally in premontane rainforest and pine-oak forest as low as 1,220 m (Jadin et al. 2012). As indicated by Jadin et al. (2012: 10), this snake "occurs in at least 13 isolated highland forest areas across Eastern Nuclear Central America…and all known populations…are found within the borders of Honduras and El Salvador." This juvenile individual was found in Refugio de Vida Silvestre Texíguat, in north-central Honduras. One of the describers of this taxon is the dedicatee of this paper, and the snake was named in honor of one of the authors. *Photo by Josiah H. Townsend.*

DEDICATION

We are happy to dedicate this paper to our friend and colleague, Josiah H. Townsend, Associate Professor of Biology at Indiana University of Pennsylvania, in Indiana, Pennsylvania. Over the last two decades, since he was a student in one of Larry Wilson's classes, Joe has built an imposing reputation as the principal authority on the herpetofauna of the biogeographically significant Chortís Highlands of northern Central America. During this time he amassed important collections, and their study is demonstrating that the herpetofaunal diversity of this region of Mesoamerica has been seriously underestimated, especially among anurans, salamanders, and squamates. Since 2006, Joe has authored or co-authored the descriptions of 21 new taxa from northern Central America, including one anuran, 10 salamanders, four lizards, and six snakes. He also has produced important summary papers on the Mesoamerican herpetofauna, including several coauthored chapters in the 2010 book *Conservation of Mesoamerican Amphibians and Reptiles* (Wilson et al. 2010; Johnson et al. 2010; Townsend and Wilson 2010a, b), a 2014 paper entitled "Characterizing the Chortís Block Biogeographic Province: geological, physiographic, and ecological associations and herpetofaunal diversity," and a 2016 paper entitled "Amphibians of the Cordillera Nombre de Dios, Honduras: COI barcoding suggests underestimated taxonomic diversity in a threatened endemic fauna." Additionally, Joe co-authored the 2006 book *The Amphibians and Reptiles of the Honduran Mosquitia* (McCranie et al. 2006) and the 2008 book *Amphibians and Reptiles of Cusuco National Park, Honduras* (Townsend and Wilson 2008). During his career Joe has collaborated with a sizable number of colleagues and students to underscore the significant biodiversity of northern Central America, as an important component of the overall Mesoamerican herpetofauna. The collections he assembled in remote regions will continue to provide insights into the phylogenetic relationships and phylogeography of this herpetofauna, and we believe his trajectory will position him as one of the most influential herpetologists of his era.

The frog in this photograph is a partially metamorphosed individual of *Rana* (*Lithobates*) *lenca*, recently described as a new species from Honduras in the following paper: Luque-Montes, Ileana, James D. Austin, Kayla D. Weinfurther, Larry David Wilson, Erich P. Hofmann, and Josiah H. Townsend. 2018. An integrative assessment of the taxonomic status of putative hybrid leopard frogs (Anura: Ranidae) from the Chortís Highlands of Central America, with description of a new species. *Systematics and Biodiversity* 2018: 1–17. This paper is an example of the seminal work being conducted by Joe Townsend and his colleagues, which is exposing the underestimated herpetofaunal diversity of the biogeographically significant Chortís Highlands. The frog was photographed in a shallow pond above the Thomas Cabot Biological Station at an elevation of 1,640 m, within Reserva Biológica Cerro Uyuca in the department of Francisco Morazán. The pond is located in pine forest, along a trail that leads from the biological station to the summit of Cerro Uyuca. This frog is an inhabitant of the "weeping woods" or cloud forest, so beautifully described by Archie Carr in the first chapter of his 1953 book *High Jungles and Low*.

Josiah H. Townsend photographed in 2008 along the Río Arcáqual in Parque Nacional Celaque, on a trail between the visitors' center and the summit of Cerro Celaque. At that time Joe was undergoing a marathon period of fieldwork in an effort to assess the composition, distribution, and conservation status of the amphibian herpetofauna of Honduras. Cerro Celaque is the highest mountain in Honduras, and a site that contains substantial herpetofaunal diversity and endemicity. Ongoing research in Joe's lab likely will add to the diversity of salamander species found on this mountain. Joe is considered the principal authority on the herpetofauna of the Chortís Highlands of Central America and is one of the leading investigators employing next-generation techniques in molecular systematics to recover underestimated phylogenetic diversity, especially in threatened endemic herpetofaunas. *Photo by Ileana Luque-Montes.*

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The endemic herpetofauna of Central America: a casualty of anthropocentrism

[1]Vicente Mata-Silva, [2]Dominic L. DeSantis, [3]Elí García-Padilla, [4]Jerry D. Johnson, and [5]Larry David Wilson

[1,2,4]Department of Biological Sciences, The University of Texas at El Paso, El Paso, Texas 79968-0500, USA [3]Oaxaca de Juárez, Oaxaca 68023, MEXICO [5]Centro Zamorano de Biodiversidad, Escuela Agrícola Panamericana Zamorano, Departamento de Francisco Morazán, HONDURAS

***Abstract.*—The endemic herpetofauna of Central America is of global significance, and currently consists of 623 species, 56.9% of a total herpetofauna of 1,095 species. During the last two years 43 endemic species have been added to this total, and one species has been deleted. The endemic herpetofauna of Central America is distributed unevenly among 10 physiographic regions, ranging from six species in the Yucatan Platform to 254 in the Isthmian Central American highlands. The distributions of close to three quarters of the 623 species are limited to a single physiographic region, and our assessment of their conservation status indicates that about nine-tenths of these species lie within the high vulnerability range of the Environmental Vulnerability Score (EVS). We prioritized the conservation significance of the Central American species by combining the data on physiographic distribution with those of the EVS and recognize 14 priority levels. About eight of every 10 endemic species occupy the first two priority levels, i.e., high vulnerability species limited to one or two physiographic regions. Protecting the endemic component of the Central American herpetofauna is the greatest challenge currently facing conservation professionals working in this region. We conclude that this goal will not be reached until humanity, in general, addresses the issues generated by the widespread adoption of the anthropocentric worldview.**

Keywords. Anthropocentric worldview, anurans, caudates, caecilians, conservation significance, endemism, extinction risk, squamates, turtles

***Resumen.*—La herpetofauna endémica de Centroamérica es de importancia global y actualmente consiste de 623 especies, 56.9% de una herpetofauna total de 1,095 especies. Durante los dos últimos años, 43 especies endémicas han sido agregadas a la lista, y una especie ha sido eliminada. La herpetofauna endémica de Centroamérica está distribuida de forma desigual entre 10 regiones fisiográficas, que va de seis especies en la Plataforma de Yucatán, a 254 en las Tierras Altas del Istmo Centroamericano. Las distribuciones de aproximadamente tres cuartos de las 623 especies están limitadas a una sola región fisiográfica, y nuestra evaluación sobre su estatus de conservación indica que alrededor de nueve décimas de estas especies se localizan dentro de la categoría de vulnerabilidad alta del sistema de puntaje de vulnerabilidad ambiental (EVS). Ordenamos la importancia de conservación de las especies centroamericanas combinando los datos sobre su distribución fisiográfica con los de EVS, y reconocemos 14 niveles de prioridad. Aproximadamente ocho de cada 10 especies endémicas ocupan los dos primeros niveles de prioridad, por ejemplo, especies con vulnerabilidad alta limitadas a una o dos regiones fisiográficas. La protección del componente endémico de la herpetofauna de Centroamérica es el mayor reto para los profesionales de la conservación que trabajan en esta región. Concluimos que esta meta no será lograda hasta que la humanidad en general confronte los problemas generados por una visión antropocéntrica del mundo.**

Palabras Claves. Visión antropocéntrica del mundo, anuros, caudados, cecilios, importancia de conservación, endemismo, riesgo de extinción, escamosos, tortugas

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Correspondence. [1] *vmata@utep.edu* [2] *dldesantis@miners.utep.edu* [3] *eligarcia_18@hotmail.com* [4] *jjohnson@utep.edu* [5] *bufodoc@aol.com*

"… losses, whether of species, landscapes, or seascape, -a world without-will become simply the new default. But whether we notice them or not, these losses matter because each diminishes our experiences, pleasures, and possibilities…"

David W. Orr (2016)

Introduction

Johnson et al. (2017) examined the biodiversity and conservation status of the endemic herpetofauna of Mexico, which then consisted of 789 species and presently amounts to 792 species. Johnson et al. (2017) concluded that this endemic herpetofauna is of global significance and has become severely imperiled as a consequence of actions by humans. These authors calculated that the endemic Mexican herpetofauna constituted 61.0% of the total of 1,292 herpetofaunal species in the country.

This paper is a companion piece to Johnson et al. (2017), and places the 623 endemic species in Central America into 14 conservation priority levels. Our approach is the same as that stipulated by Johnson et al. (2017) in their Introduction and section on Biodiversity Decline.

Given that the foundation and conclusions of this paper are based on the results of Johnson et al. (2017), we briefly quote the first four conclusions in that paper (see p. 614), as follows:

"A. The complex interplay among the atmosphere, hydrosphere, and lithosphere allows for the existence of life on planet Earth."

"B. Humans are faced with the consequences of an interrelated amalgam of global problems of their own making, which impact the atmosphere, hydrosphere, lithosphere, and biosphere. These problems are sufficiently grave to threaten the continued existence of life."

"C. Biodiversity decline is a problem of global dimensions. This decline impacts life at all levels: from the ecosystem, through the species comprising these ecosystems, to the genes prescribing the traits of these species."

"D. Throughout its history, life has been subjected to a series of mass extinction episodes that have preceded the current sixth episode of humanity's design."

In this paper we underscore the significance of the endemic herpetofauna of Central America and assess its conservation status. The continued existence of this endemic herpetofauna hinges on sustaining the region's life-support systems, i.e., the group of interacting elements in the atmosphere, hydrosphere, and lithosphere that allow for the maintenance of life on the planet. As a rational species, we believe that humans are responsible for protecting and preserving the diversity of life on the planet, as well as improving the quality of life for humans and other life forms. For this reason, we are diametrically opposed to the ideas recently promulgated by R. Alexander Pyron in a perspective published in *The Washington Post* (2017), that "we don't need to save endangered species" because "extinction is part of evolution," and further that, "the only creatures we should go out of our way to protect are *Homo sapiens*."

Recent Changes to the Central American Herpetofauna

Even while facing an increasing tempo for global biodiversity decline (Ceballos et al. 2017), herpetologists continue to increase the number of known species of amphibians and reptiles from around the world (see the AmphibiaWeb and Reptile Database websites). Johnson et al. (2015) reported 92 additional taxa to the Central American herpetofaunal list, based on the cutoff date established for the list in Wilson and Johnson (2010). For this paper, which considers the endemic members of the Central American herpetofauna, we added 19 taxa of amphibians and 24 of reptiles to the list presented in Johnson et al. (2015). We list these taxa and their supportive publications below.

Incilius mayordomus—Savage et al. 2013. *Copeia* 2013: 8–12. New species.

Hyalinobatrachium dianae—Kubicki et al. 2015. *Zootaxa* 3920: 69–84. New species.

Craugastor gabbi—Arias et al. 2016. *Zootaxa* 4132: 347–363. New species.

Diasporus darienensis—Batista et al. 2016a. *Zoological Journal of the Linnean Society* 178: 267–311. New species.

Diasporus majeensis—Batista et al. 2016a. *Zoological Journal of the Linnean Society* 178: 267–311. New species.

Diasporus pequeno—Batista et al. 2016a. *Zoological Journal of the Linnean Society* 178: 267–311. New species.

Diasporus sapo—Batista et al. 2016a. *Zoological Journal of the Linnean Society* 178: 267–311. New species.

Plectrohyla calvata—McCranie. 2017a. *Mesoamerican Herpetology* 4: 389–401. New species.

Smilisca manisorum—McCranie. 2017c. *Mesoamerican Herpetology* 4: 512–526. Resurrected from synonymy of *Smilisca baudinii.*

Lithobates lenca—Luque-Montes et al. 2018. *Systematics and Biodiversity* 2018: 1–17. New species.

Bolitoglossa aurae—Kubicki and Arias. 2016. *Zootaxa* 4184: 329–346. New species.

Bolitoglossa chucutaniensis—Batista et al. 2014. *Mesoamerican Herpetology* 1: 96–121. New species.

Cryptotriton xucaneborum—Rovito et al. 2015. *Zoological Journal of the Linnean Society* 175: 150–166. New species.

Nototriton costaricense—Arias and Kubicki. 2018. *Zootaxa* 4369: 487–500. New species.

Nototriton nelsoni—Townsend. 2016. *Zootaxa* 4196: 511–528. New species.

Nototriton oreadorum—Townsend. 2016. *Zootaxa* 4196: 511–528. New species.

Oedipina berlini—Kubicki. 2016. *Mesoamerican Herpetology* 3: 819–840. New species.

Oedipina capitalina—Solís et al. 2016. *Salamandra* 42: 125–133. New species.

Oedipina salvadorensis—Brodie et al. 2012. *Journal of Herpetology* 46: 233–240. Resurrected from synonymy of *Oedipina taylori.*

Celestus laf—Lotzkat et al. 2016. *Mesoamerican Herpetology* 3: 962–975. New species.

Mesaspis cuchumatanus—Solano-Zavaleta et al. 2016. *Journal of Herpetology* 50: 327–335. New species

Mesaspis salvadorensis—Solano-Zavaleta and Nieto-Montes de Oca. 2018. *Molecular Phylogenetics and Evolution* 120: 16–27. Elevated from subspecies to species level.

Dactyloa brooksi—Poe and Ryan. 2017. *Amphibian & Reptile Conservation* 11: 1–16. Resurrected from the synonymy of *Dactyloa insignis.*

Dactyloa kathydayae—Poe and Ryan. 2017. *Amphibian & Reptile Conservation* 11: 1–16. New species.

Dactyloa maia—Batista et al. 2015b. *Zootaxa* 4039: 57–84. New species.

Dactyloa savagei—Poe and Ryan. 2017. *Amphibian & Reptile Conservation* 11: 1–16. New species.

Norops elcopeensis—Poe et al. 2015. *Amphibian & Reptile Conservation* 9: 1–13. New species.

Norops mccraniei—Köhler et al. 2016. *Mesoamerican Herpetology* 3: 8–41. New species.

Norops oxylophus—McCranie and Köhler. 2015. *Bulletin of the Museum of Comparative Zoology* SPS(1): 1–292. Recognition as distinct from *Norops lionotus.*

Norops wilsoni—Köhler et al. 2016. *Mesoamerican Herpetology* 3: 8–41. New species.

Lepidoblepharis emberawoundule—Batista et al. 2015a. *Zootaxa* 3994: 187–221. New species.

Lepidoblepharis rufigularis—Batista et al. 2015a. *Zootaxa* 3994: 187–221. New species.

Lepidoblepharis victormartinezi—Batista et al. 2015a. *Zootaxa* 3994: 187–221. New species.

Ameiva fuliginosa—McCranie and Gotte. 2014. *Proceedings of the Biological Society of Washington* 127: 543–556. Elevation from subspecies to species level.

Holcusus miadis—Meza-Lázaro et al. 2015. *Zoological Journal of the Linnean Society* 2015: 1–22. Elevation from subspecies to species level.

Tantilla berguidoi—Batista et al. 2016b. *Mesoamerican Herpetology* 3: 949–960. New species

Tantilla excelsa—McCranie and Smith. 2017. *Herpetologica* 73: 338–348. New species.

Tantilla gottei—McCranie and Smith. 2017. *Herpetologica* 73: 338–348. New species.

Tantilla stenigrammi—McCranie and Smith. 2017. *Herpetologica* 73: 338–348. New species.

Rhadinella lisyae—McCranie. 2017b. *Mesoamerican Herpetology* 4: 243–253. New species.

Epictia martinezi—Wallach. 2016. *Mesoamerican Herpetology* 3: 216–374. New species.

Epictia pauldwyeri—Wallach. 2016. *Mesoamerican Herpetology* 3: 216–374. New species.

Bothriechis nubestris—Doan et al. 2016. *Zootaxa* 4138: 271–290. New species.

The Distributional Status of *Dipsas viguieri*

Peters (1960) reviewed the taxonomic status of members of the subfamily Dipsadinae, and placed nine species in the *Dipsas articulata* group, collectively distributed from western and southeastern Mexico to northwestern Ecuador. Peters' view of the species-level relationships among the members of the *articulata* group was impacted by the paucity of specimens of each taxon known at that time, and he noted that only minimal scale and color differences separated certain species. Peters (1960) indicated the range of *D. viguieri* as the Pacific coast of Panama.

Pérez Santos and Moreno (1988) reported on a specimen of *D. gracilis* from the Pacific coast of Colombia (see discussion below), and Pérez Santos (1999) noted the occurrence of *D. viguieri* from both versants of Panama, including a specimen from the province of Bocas del Toro in the western part of the country. Subsequently, Köhler (2001; 2003; 2008) noted the range of *Dipsas viguieri* as eastern Panama and western Colombia but did not provide additional information. Cadle (2005), in a paper on the systematics of the *Dipsas oreas* complex, tentatively referred to a specimen (FMNH 74376) from northwestern Colombia near the Panama border as *D. viguieri*, which previously had been identified as *D. gracilis*. Nonetheless, Cadle (2005) stated that these two taxa were not distinguishable by any reported characteristics, and on p. 128 noted that, "Without additional study, I am unable to adequately differentiate *Dipsas viguieri* (eastern Panama and northern Chocó, Colombia) and *D. gracilis* (western Ecuador and extreme northern Peru)." Further, based on an examination of morphological characters, Cadle indicated geography as

Plate 1. *Atelopus varius* (Lichtenstein and Martens, 1856). The Harlequin Frog is a priority ten species with an EVS of 11, distributed on both versants of the cordilleras of Costa Rica and western Panama (Frost 2018). This individual is from one of three known surviving populations of this species, and in Costa Rica it is being surveyed near Uvita, in the province of Puntarenas. *Photo by César Barrio-Amorós.*

Plate 2. *Incilius holdridgei* (Taylor, 1952). Holdridge's Toad is a priority one species with an EVS of 14, which is restricted in distribution to Volcán Barva, Costa Rica (Frost 2018). This individual was located in Alto del Roble, in the province of Heredia. *Photo by Víctor Acosta-Chaves.*

Plate 3. *Incilius melanochlorus* (Cope, 1877). The Wet Forest Toad is a priority eight species with an EVS of 12, with a distribution on the Atlantic versant of Costa Rica and adjacent Panama, and likely in adjacent Nicaragua (Frost 2018). This individual was found in Centro Soltis, San Isidro de Peñas Blancas, in the province of Alajuela, Costa Rica. *Photo by Víctor Acosta-Chaves.*

the only currently reliable means of assigning names to these species. Similarly, in discussing a number of poorly-known *Dipsas* from South America, Harvey (2008) commented that he was unable to distinguish *D. viguieri* from *D. gracilis*, and thus did not include *D. viguieri* in his key but noted that the *D. articulata* complex requires further study.

Jaramillo et al. (2010) and Johnson et al. (2015) regarded *Dipsas viguieri* as endemic to Panama. Wallach et al. (2014: 235), however, considered *D. viguieri* as occupying "Eastern Panama (Canal Zone, Darién, Panamá) and Colombia (? Chocó, Piura), NSL–60 m." In their *D. gracilis* account, however, these authors noted, "Colombian record doubtful *fide* Cadle (2005: 123): possibly *D. viguieri*. *Dipsas gracilis* and *D. viguieri* possibly conspecific *fide* Harvey (2008: 429)." Wallach et al. (2014: 232), however, apparently confused the information provided by Cadle (2005), as the FMNH specimen tentatively was referred to *D. viguieri* and not *D. gracilis*. Finally, Ray (2017) indicated the range of *D. viguieri* as eastern Panama to northwestern Colombia.

The historical timeline for information on the distribution and taxonomic status of *Dipsas viguieri* has been unclear, as different workers have maintained that this species is endemic to Panama or occurs in both Panama and Colombia. In the absence of a definitive analysis involving morphological and molecular approaches, for the purpose of this paper we are considering *D. viguieri* as not endemic to Panama.

Global Status of the Central American Herpetofauna

As with the Mexican herpetofauna (Johnson et al. 2017), the Central American herpetofauna also is highly diverse, consisting of 60 families, 214 genera, and 1,095 species (Table 1), organized into six orders (Anura, Caudata, Gymnophiona, Crocodylia, Squamata, and Testudines). The level of herpetofaunal diversity in Central America is intermediate between that found in Mexico and North America (United States–Canada). The number of species in the United States–Canada is the same as Johnson et al. (2017) reported, i.e., 650 (Center for North American Herpetology website; accessed 9 December 2017). Johnson et al. (2017) reported the number of species in Mexico as 1,292.

Even though the number of herpetofaunal species occurring in Central America is intermediate between that found in the United States–Canada and Mexico, Central America contains about 8.5 times the number of taxa by area as found in Mexico, and 155.6 times the number found in the United States–Canada. Thus, the relative degree of biodiversity is significantly higher in Central America when compared to that in Mexico and the United States–Canada.

If we consider Central America as a single region in our analysis (i.e., not one divided into seven countries), then its herpetofauna also is significant when compared to that of other areas in Latin America. With respect to amphibians, the 509 species occurring in Central America is the fifth largest in Latin America (amphibiaweb.com; 15 April 2018), and is closest to that for the country of Ecuador, at 562. The area/species ratio for Ecuador however, is 504.6, compared to 998.0 for Central America.

Considering the numbers of crocodylian, squamate, and turtle species, the 586 species in Central America is comparable to that recorded for the neighboring country of Colombia, which is 611 (reptile-database.org; accessed 29 December 2017). Colombia, however, with an area of 1,141,748 km^2, is 2.25 times the size of Central America, which contains an area of 507,966 km^2 (www. Oei.es/historico/cultura2/Colombia/03.htm; accessed 29 December 2017). Thus, the area/species ratio for Colombia is 1,868.7, compared to 868.0 for that of Central America. Only Brazil (799) and Colombia in South America contain more species than Central America (reptile-database.org; accessed 29 December 2017).

Endemism within the Central American Herpetofauna

The proportion of herpetofaunal endemism in Central America is slightly less than in Mexico, the other major segment of Mesoamerica. The percentage in Central America is 56.9 (Table 2) compared to 61.1 in Mexico (Johnson et al. 2017). This percentage in Central America is based on an endemic herpetofauna of 623 species and a total herpetofauna of 1,095 species (Table 2). Both of the comparable figures for the Mexican herpetofauna are higher, i.e., 789 and 1,292 (Johnson et al. 2017). As noted by Johnson et al. (2015: 26), "Mesoamerica is one of the world's most important biodiversity reservoirs, and Central America contains a substantial component of that region's herpetofauna." We illustrate the breakdown of the total and endemic components of the Central American herpetofauna in Fig. 1. This graph shows the close correspondence between the endemic and total number of salamander species, the relatively distant correspondence between the endemic and total number of squamate species, and the intermediate correspondence between the two figures for anurans (Fig. 1).

Of the 60 families represented in Central America, 38 (63.3%) contain endemic species (Table 2). This leaves 22 families with no endemic representation, including the anuran families Aromobatidae, Hemiphractidae, and Rhinophrynidae, the crocodylian families Alligatoridae and Crocodylidae, the squamate families Amphisbaenidae, Hoplocercidae, Polychrotidae, Xenosauridae, Boidae, Charinidae, Loxocemidae, Natricidae, Sibynophiidae, and Tropidophiidae, and the turtle families Cheloniidae, Chelydridae, Dermatemydidae, Dermochelyidae, Emydidae, Staurotypidae, and Testudinidae. In Central America these are small-content families, with species numbers ranging from one to five (Table 2). The families with endemic representation have total numbers ranging from one to 166; the endemic numbers vary from one to 143 (Table 2).

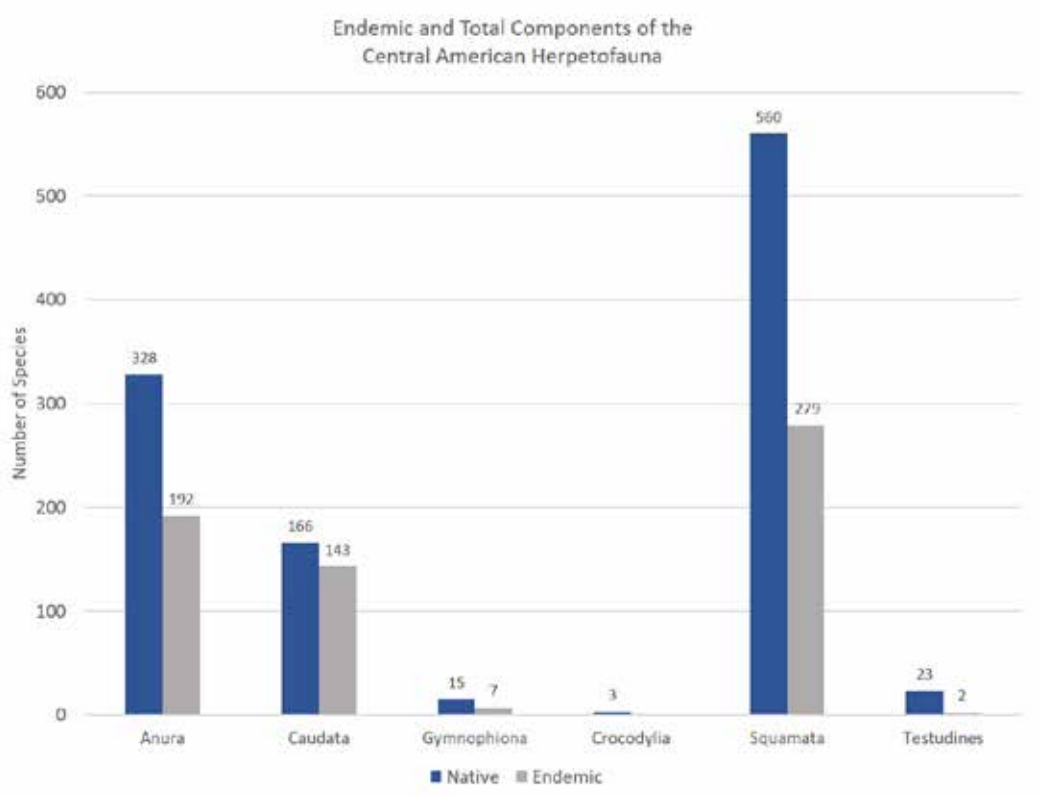

Fig. 1. Graph comparing the endemic and total number of species for the Central American herpetofauna, arranged by order.

Table 1. Diversity of the Central American herpetofauna at the familial, generic, and specific levels.

Orders	Families	Genera	Species
Anura	14	58	328
Caudata	1	7	166
Gymnophiona	2	4	15
Crocodylia	2	2	3
Squamata	32	130	560
Testudines	9	13	23
Totals	**60**	**214**	**1,095**

Table 2. Degree of endemism of the Central American herpetofauna at the species level, arranged by family.

Family	Total Number of Species	Number of Endemic Species	Percentage of Endemism
Aromobatidae	1	—	—
Bufonidae	40	24	60.0
Centrolenidae	15	4	26.7
Craugastoridae	102	77	75.5
Dendrobatidae	21	14	66.7
Eleutherodactylidae	16	10	62.5
Hemiphractidae	3	—	—
Hylidae	92	52	60.9
Leptodactylidae	9	1	11.1
Microhylidae	9	1	11.1
Phyllomedusidae	7	2	28.6
Pipidae	1	1	100

Table 2 (continued). Degree of endemism of the Central American herpetofauna at the species level, arranged by family.

Family	Total Number of Species	Number of Endemic Species	Percentage of Endemism
Ranidae	11	6	54.5
Rhinophrynidae	1	—	—
Subtotals	**328**	**192**	**58.5**
Plethodontidae	166	143	86.1
Subtotals	**166**	**143**	**86.1**
Caeciliidae	7	3	42.9
Dermophiidae	8	4	50.0
Subtotals	**15**	**7**	**46.7**
Totals	**509**	**342**	**67.2**
Alligatoridae	1	—	—
Crocodylidae	2	—	—
Subtotals	**3**	**—**	**—**
Amphisbaenidae	2	—	—
Anguidae	32	25	78.1
Corytophanidae	9	1	11.1
Dactyloidae	104	74	71.2
Eublepharidae	2	1	50.0
Gymnophthalmidae	14	3	21.4
Helodermatidae	2	1	50.0
Hoplocercidae	2	—	—
Iguanidae	9	7	77.8
Mabuyidae	5	4	80.0
Phrynosomatidae	17	2	11.8
Phyllodactylidae	5	3	60.0
Polychrotidae	1	—	—
Scincidae	3	1	33.3
Sphaerodactylidae	22	13	59.1
Sphenomorphidae	4	1	25.0
Teiidae	16	5	31.3
Xantusiidae	4	2	50.0
Xenosauridae	1	—	—
Anomalepididae	3	1	33.3
Boidae	5	—	—
Charinidae	2	—	—
Colubridae	79	30	38.0
Dipsadidae	145	77	53.1
Elapidae	19	6	31.6
Leptotyphlopidae	6	3	50.0
Loxocemidae	1	—	—
Natricidae	5	—	—
Sibynophiidae	2	—	—
Tropidophiidae	1	—	—
Typhlopidae	5	3	60.0
Viperidae	33	16	48.5
Subtotals	**560**	**279**	**49.8**
Cheloniidae	4	—	—

Table 2 (continued). Degree of endemism of the Central American herpetofauna at the species level, arranged by family.

Family	Total Number of Species	Number of Endemic Species	Percentage of Endemism
Chelydridae	2	—	—
Dermatemydidae	1	—	—
Dermochelyidae	1	—	—
Emydidae	2	—	—
Geoemydidae	5	1	20.0
Kinosternidae	4	1	25.0
Staurotypidae	3	—	—
Testudinidae	1	—	—
Subtotals	**23**	**2**	**8.7**
Totals	**586**	**281**	**48.0**
Sum Totals	**1,095**	**623**	**56.9**

Of the 14 anuran families with representatives in Central America, 11 contain endemic species, which include 192 (58.5%) of the total of 328 species (Table 2). Of these 11 families, the largest numbers of endemics are 77 in the Craugastoridae and 52 in the Hylidae. Other than in the Pipidae, with one total and one endemic species (100%), as might be expected, the percentage of endemism is next highest in the Craugastoridae (75.5%), but the third highest is in the Dendrobatidae (66.7%), and not the Hylidae (60.9%). The value for the Eleutherodactylidae (62.5%) also is higher than that for the Hylidae. The remaining families contain from one to 24 endemic species (Table 2).

A single family of salamanders, the Plethodontidae, occurs in Central America. The percentage of endemism (86.1%) is amazingly high and is the highest in all the 38 families represented (Table 2).

The endemic species of caecilians (seven) make up less than one-half (46.7%) of the total number of 15 in Central America. Three of the endemics are caeciliids and four are dermophiids.

None of the three species of crocodylians in Central America is endemic. *Crocodylus acutus* and *Caiman crocodilus* rather are among the naturally most broadly distributed herpetofaunal species in the Western Hemisphere.

The squamates are the most speciose group of herpetofaunal organisms in Central America, with 560 species distributed among 32 families (Table 2). Only the endemic proportions of turtles (8.7%) and crocodylians (0.0%) are lower than those of squamates (49.8%). The endemic squamates are more or less evenly divided between the lizards (143) and snakes (136). Of the 19 families of lizards with representatives in Central America, 15 contain endemic species (78.9%). The largest numbers of endemic squamate species are found within the families Dactyloidae (74) and Dipsadidae (77). The next largest number of endemic lizards (25) is allocated to the family Anguidae. The remaining 12 lizard families contain only one to 13 endemic species. The percentage of endemism among the lizard families ranges from 11.1% in the Corytophanidae to 80.0% in the Mabuyidae (Table 2). Thirteen families of snakes are represented in Central America, of which seven contain endemic species (53.8%). The greatest numbers of endemic species are in the families Dipsadidae (77) and Colubridae (30). The next largest number (16) lies within the family Viperidae; the remaining four snake families contain from one to six endemic species (Table 2). The percentage of endemism among the snake families ranges from 31.6% in the Elapidae to 60.0% in the Typhlopidae (Table 2).

The percentage of endemism among turtles is very low, with only two such species among a total of 23 (8.7%), one each in the families Geoemydidae and Kinosternidae (Table 2).

At the ordinal level, the percentage of endemism is highest among the salamanders at 86.1%, the same figure as for the family Plethodontidae, since it is the only family of salamanders found in Central America (Table 2). The percentage is lowest among the crocodylians at 0.0%. Intermediate values are evident for the anurans (58.5%), squamates (49.8%), and caecilians (46.7%).

The level of herpetofaunal endemism in Central America is comparable to that found in the other portions of the North American continent, i.e., Mexico, as well as the United States–Canada (Table 3). The overall level for Central America, however, is slightly lower (56.9%) than for either Mexico (61.5%) or the United States–Canada (61.2%).

Although, as expected, the total number of herpetofaunal species is lower in the United States–Canada than to the south in Mesoamerica (Table 3); even with the greater area of the two northern nations, the level of endemism still is impressive. Of the total of 650 species in the United States–Canada, 398 are endemic, for a percentage of endemism of 61.2%. Notably, this level of endemism is based heavily on the amphibians, especially the salamanders. The proportion of amphibian endemism is more than 10 points higher in the United States–Canada (78.6%) than in Mexico (68.3%) or Central America (67.2%). The percentage of endemism is higher for both anurans and salamanders in the United States–Canada (64.4% and 86.4%, respectively) than for these two groups in either Mexico (60.0% and 82.8%, respectively) or Central America (58.5% and 86.1%, respectively). Significantly, the level of amphibian endemism in all three regions heavily depends on the

Plate 4. *Craugastor sandersoni* (Schmidt, 1941). Sanderson's Rainfrog is a priority two species with an EVS of 19, which is distributed on the "Caribbean slopes of the Maya Mountains in east-central Belize southward to the Montañas del Mico in eastern Guatemala and westward into the Sierra de Santa Cruz, the eastern portion of the Sierra de las Minas, and the foothills of the northern Alta Verapaz" (Frost 2018). This individual was found in Montañas del Mico, Guatemala. *Photo by Sean Michael Rovito.*

Plate 5. *Oophaga granulifera* (Taylor, 1958). The Granular Poison Frog is a priority two species with an EVS of 17, distributed in the Golfo Dulce region of Pacific coastal Costa Rica and presumably in adjacent Panama (Frost 2018). This individual was encountered in Ciudad Cortéz de Osa, in the province of Puntarenas, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 6. *Oophaga pumilio* (Schmidt, 1857). The Strawberry Poison Frog is a priority one species with an EVS of 16, and its distribution extends along the Atlantic versant from "eastern Nicaragua…south through the lowlands of Costa Rica and northwestern Panama (Savage 2002: 388). This individual came from the mainland in the province of Bocas del Toro, Panama. *Photo by Abel Batista.*

Plate 7. *Oophaga vicentei* (Jungfer, Weyoldt, and Juraska, 1996). This dendrobatid frog is a priority two species with an EVS of 16, distributed on the Atlantic versant "of the provinces of Veraguas and Coclé and the upper reaches of Pacific versant in Coclé, central Panama" (Frost 2018). This individual is from Santa Fé National Park, in the province of Veraguas, Panama. *Photo by Abel Batista.*

Plate 8. *Phyllobates lugubris* (Schmidt, 1857). The Lovely Poison Frog is a priority one species with an EVS of 17, which ranges along the Atlantic versant from "extreme southeastern Nicaragua to northwestern Panama; a single record from just west of the Panama Canal" (Savage 2002: 390). This individual was found in the Donoso region, in the province of Colón, Panama. *Photo by Abel Batista.*

Plate 9. *Diasporus hylaeformis* (Cope, 1876). The Pico Blanco Robber Frog is a priority one species with an EVS of 17, with a distribution in the highlands of the cordilleras of Costa Rica and Panama (Frost 2018). This individual came from Alto del Roble, in the province of Heredia, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Table 3. Total number of species, endemic species, and relative endemism within the herpetofaunal groups in Central America, North America (United States–Canada), and Mexico. Data for Central America from this paper, for North America from CNAH (www.cnah.org; accessed 9 January 2018), and for Mexico from updated figures in Johnson et al. (2017).

Herpetofaunal Groups	Total Species in Central America	Endemic Species in Central America	Relative Endemism in Central America (%)	Total Species in North America	Endemic Species in North America	Relative Endemism in North America (%)	Total Species in Mexico	Endemic Species in Mexico	Relative Endemism in Mexico (%)
Anurans	328	192	58.5	104	67	64.4	247	148	60.0
Salamanders	166	143	86.1	191	165	86.4	151	125	82.8
Caecilians	15	7	46.7	—	—	—	3	1	33.3
Subtotals	**509**	**342**	**67.2**	**295**	**232**	**78.6**	**401**	**274**	**68.3**
Crocodylians	3	—	—	2	1	50.0	3	—	—
Squamates	560	279	49.8	287	117	40.8	863	517	60.0
Turtles	23	2	8.3	66	48	72.7	51	20	39.2
Subtotals	**586**	**281**	**48.0**	**355**	**166**	**46.8**	**917**	**537**	**58.6**
Totals	**1,095**	**623**	**56.9**	**650**	**398**	**61.2**	**1,318**	**811**	**61.5**

salamanders, i.e., over 80%. Curiously enough, such high incidences of salamander species-level endemism are not correlated with the incidence of family-level endemism, which decreases markedly from the United States–Canada through Mexico to Central America. The 191 salamander species in the United States–Canada are organized within eight families, but with the majority allocated to the family Plethodontidae (Center for North American Herpetology website; accessed 2 January 2018). Four of these eight families, the Amphiumidae, Cryptobranchidae, Proteidae, and Rhyacotritonidae occur no farther south than the United States. Four families, the Ambystomatidae, Plethodontidae, Salamandridae, and Sirenidae are represented in Mexico, but with the greatest number of species in the Plethodontidae, as in the United States–Canada. Only a single family, the Plethodontidae, is found in Central America. In the United States–Canada, 145 of the 191 species of salamanders are in the family Plethodontidae (75.9%). Of the 151 species found in Mexico 130 (86.1%) are in the Plethodontidae (Wilson et al., 2017); the remaining 21 species are allocated to three families (see above). Finally, of the 166 species of salamanders found in Central America, all are in the Plethodontidae; obviously the percentage of occupancy is 100%.

Unlike the situation among the amphibians, the level of endemism among the crocodylians, squamates, and turtles is significantly lower in all three regions dealt with in Table 3. The level of endemism among these taxa is lowest in the United States–Canada (46.8%), next lowest in Central America (48.0%), and highest in Mexico (58.6%). Given that squamates constitute the largest group, compared to the other two, the same pattern would be expected for them as for the entire group. Thus, the level of squamate endemism is lowest in the United States–Canada (40.8%), intermediate in Central America (49.8%), and highest in Mexico (60.0%).

The differential between the percentages of endemism for amphibians versus the remainder of the herpetofauna (Table 3) increases from that seen in Mexico (9.7%), through Central America (19.2%), to the United States–Canada (31.8%). Thus, in all three regions amphibians contribute more to the degree of endemicity than the remainder of the herpetofauna (Table 3).

Physiographic Distribution of the Endemic Central American Herpetofauna

Given the considerable global significance of the diversity and endemicity of the Central American herpetofauna, as documented above, it is of paramount importance to protect its elements. As an initial step to determine the distributional patterns of these organisms in Central America, we collated the available information on the occurrence of the members of the herpetofauna among the 10 physiographic regions traditionally recognized in this portion of Mesoamerica (Campbell, 1999; Wilson and Johnson, 2010; Fig. 2). Six of these regions occupy the lowlands of Central America, including the Yucatan Platform, the Caribbean lowlands of eastern Guatemala and northern Honduras, the Caribbean lowlands from Nicaragua to Panama, the Pacific lowlands from eastern Chiapas to south-central Guatemala, the Pacific lowlands from southeastern Guatemala to northwestern Costa Rica, and the Pacific lowlands from central Costa Rica through Panama (Table 4). Four regions are found in the highlands of Central America, including the western nuclear Central American highlands, the eastern nuclear Central American highlands, the Isthmian Central American highlands, and the highlands of eastern Panama (Table 4). We document the distribution of the 623 endemic members of the Central American herpetofauna among the 10 physiographic regions in Table 4, and summarize these data in Table 5 and Fig. 3.

The total number of the endemic species distributed within the 10 physiographic regions ranges from a low of six in the Yucatan Platform to 254 in the Isthmian Central American highlands (Table 5). The mean regional occupancy figure

Fig. 2. Physiographic regions of Central America, after Campbell (1999). Abbreviations are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform.

Table 4. Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										**Totals**
	CG	**HN**	**CRP**	**EP**	**YP**	**GH**	**NP**	**CGU**	**GCR**	**CP**	
Anura (192 species)											
Bufonidae (24 species)											
Atelopus certus			+	+							2
Atelopus chiriquiensis			+								1
Atelopus chirripoensis			+								1
Atelopus limosus							+				1
Atelopus senex			+								1
Atelopus varius			+				+			+	3
Atelopus zeteki			+							+	2

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Incilius aucoinae										+	1
Incilius chompipe			+								1
Incilius epioticus			+								1
Incilius fastidiosus			+								1
Incilius guanacaste			+								1
Incilius holdridgei			+								1
Incilius ibarrai	+	+									2
Incilius karenlipsae			+								1
Incilius leucomyos		+				+					2
Incilius majordomus			+								1
Incilius melanochlorus			+								1
Incilius periglenes			+								1
Incilius peripatetes			+								1
Incilius porteri		+									1
Incilius signifer			+							+	2
Rhinella centralis							+			+	2
Rhinella chrysophora		+									1
Centrolenidae (4 species)											
Cochranella granulosa		+	+			+	+			+	5
Hyalinobatrachium dianae			+				+				2
Hyalinobatrachium talamancae			+								1
Hyalinobatrachium vireovittatum			+								1
Craugastoridae (77 species)											
Craugastor adamastus	+										1
Craugastor anciano		+									1
Craugastor andi			+								1
Craugastor angelicus			+								1
Craugastor aphanus	+										1
Craugastor aurilegulus		+				+					2
Craugastor azueroensis										+	1
Craugastor bocourti	+										1
Craugastor bransfordii			+				+				2
Craugastor campbelli	+					+					2
Craugastor catalinae			+								1
Craugastor chac	+	+				+					3
Craugastor charadra		+				+					2
Craugastor chingopetaca							+				1
Craugastor chrysozetetes		+									1
Craugastor coffeus		+									1
Craugastor cruzi		+									1
Craugastor cuaquero			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										**Totals**
	CG	**HN**	**CRP**	**EP**	**YP**	**GH**	**NP**	**CGU**	**GCR**	**CP**	
Craugastor cyanochthebius		+									1
Craugastor daryi	+										1
Craugastor emcelae			+								1
Craugastor emleni		+									1
Craugastor epochthidius		+				+					2
Craugastor escoces			+								1
Craugastor evanesco			+				+				2
Craugastor fecundus		+				+					2
Craugastor fleischmanni			+								1
Craugastor gabbi			+								1
Craugastor gollmeri			+				+			+	3
Craugastor gulosus			+								1
Craugastor inachus	+										1
Craugastor jota			+								1
Craugastor laevissimus		+				+			+		3
Craugastor lauraster		+				+					2
Craugastor megacephalus		+	+			+	+				4
Craugastor melanostictus			+								1
Craugastor merendonensis						+					1
Craugastor milesi		+									1
Craugastor mimus		+	+			+	+				4
Craugastor monnichorum			+								1
Craugastor myllomyllon	+										1
Craugastor nefrens		+									1
Craugastor noblei		+	+			+	+			+	5
Craugastor obesus			+				+				2
Craugastor olanchano		+									1
Craugastor omoaensis		+									1
Craugastor pechorum		+				+					2
Craugastor persimilis			+				+				2
Craugastor phasma			+								1
Craugastor podiciferus			+								1
Craugastor polyptychus							+				1
Craugastor punctariolus			+								1
Craugastor ranoides			+				+		+	+	4
Craugastor rayo			+								1
Craugastor rhyacobatrachus			+								1
Craugastor rivulus	+										1
Craugastor rostralis	+	+									2
Craugastor rugosus			+							+	2
Craugastor sabrinus	+					+					2

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										**Totals**
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Craugastor saltuarius		+									1
Craugastor sandersoni	+					+					2
Craugastor stadelmani		+									1
Craugastor stejnegerianus			+						+	+	3
Craugastor tabasarae			+								1
Craugastor talamancae							+				1
Craugastor taurus										+	1
Craugastor trachydermus	+										1
Craugastor underwoodi			+								1
Craugastor xucanebi	+										1
Pristimantis adnus				+							1
Pristimantis altae			+				+				2
Pristimantis caryophyllaceus			+				+				2
Pristimantis cerasinus			+			+	+				3
Pristimantis museosus			+								1
Pristimantis pardalis			+				+			+	3
Pristimantis pirrensis				+							1
Strabomantis laticorpus				+							1
Dendrobatidae (14 species)											
Ameerega maculata?											?
Andinobates claudiae							+				1
Andinobates geminisae							+				1
Colostethus latinasus				+							1
Ectopoglossus astralogaster				+							1
Ectopoglossus isthminus				+							1
Oophaga arborea			+								1
Oophaga granulifera							+			+	2
Oophaga pumilio							+				1
Oophaga speciosa			+								1
Oophaga vicentei				+			+				2
Phyllobates lugubris							+				1
Phyllobates vittatus										+	1
Silverstoneia flotator			+				+			+	3
Eleutherodactylidae (10 species)											
Diasporus citrinobapheus			+								1
Diasporus darienensis				+							1
Diasporus diastema			+			+	+			+	4
Diasporus hylaeformis			+								1
Diasporus igneus			+								1
Diasporus majeensis				+							1
Diasporus pequeno				+							1
Diasporus sapo				+							1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										**Totals**
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Diasporus tigrillo							+				1
Diasporus ventrimaculatus			+								1
Hylidae (52 species)											
Atlantihyla panchoi	+					+					2
Atlantihyla spinipollex		+				+					2
Bromeliohyla melacaena		+									1
Dryophytes bocourti	+										1
Duellmanohyla legleri			+								1
Duellmanohyla lythrodes							+				1
Duellmanohyla rufioculis			+								1
Duellmanohyla salvadorensis	+	+									2
Duellmanohyla salvavida		+				+					2
Duellmanohyla soralia		+				+					2
Duellmanohyla uranochroa			+				+				2
Ecnomiohyla bailarina				+			+				2
Ecnomiohyla fimbrimembra			+				+				2
Ecnomiohyla minera	+										1
Ecnomiohyla rabborum			+								1
Ecnomiohyla salvaje		+									1
Ecnomiohyla sukia			+				+				2
Ecnomiohyla thysanota				+							1
Ecnomiohyla veraguensis			+								1
Exerodonta catracha		+									1
Exerodonta perkinsi	+										1
Hyloscirtus colymba			+	+							2
Isthmohyla angustilineata			+								1
Isthmohyla calypso			+								1
Isthmohyla debilis			+								1
Isthmohyla graceae			+								1
Isthmohyla infucata			+								1
Isthmohyla insolita		+									1
Isthmohyla lancasteri			+				+				2
Isthmohyla picadoi			+								1
Isthmohyla pictipes			+								1
Isthmohyla pseudopuma			+								1
Isthmohyla rivularis			+								1
Isthmohyla tica			+								1
Isthmohyla xanthosticta			+								1
Isthmohyla zeteki			+								1
Plectrohyla calvata		+									1
Plectrohyla chrysopleura		+									1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										**Totals**
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Plectrohyla dasypus		+									1
Plectrohyla exquisite		+									1
Plectrohyla glandulosa	+										1
Plectrohyla pokomchi	+										1
Plectrohyla psiloderma		+									1
Plectrohyla quecchi	+										1
Plectrohyla tecunumani	+										1
Plectrohyla teuchestes	+										1
Ptychohyla dendrophasma	+										1
Ptychohyla hypomykter	+	+				+					3
Quilticohyla sanctaecrucis	+										1
Scinax altae										+	1
Smilisca manisorum							+				1
Smilisca puma							+				1
Leptodactylidae (1 species)											
Leptodactylus silvanimbus		+									1
Microhylidae (1 species)											
Hypopachus pictiventris							+				1
Phyllomedusidae (2 species)											
Agalychnis annae			+				+				2
Agalychnis saltator			+			+	+				3
Pipidae (1 species)											
Pipa myersi										+	1
Ranidae (6 species)											
Lithobates juliani	+										1
Lithobates lenca		+									1
Lithobates miadis							+				1
Lithobates taylori							+				1
Lithobates vibicarius			+								1
Lithobates warszewitschii		+	+	+		+					4
Caudata (143 species)											
Plethodontidae (143 species)											
Bolitoglossa alvaradoi			+				+				2
Bolitoglossa anthracina			+								1
Bolitoglossa aurae			+								1
Bolitoglossa aureogularis			+								1
Bolitoglossa bramei			+								1
Bolitoglossa carri		+									1
Bolitoglossa cataguana		+									1
Bolitoglossa celaque		+									1
Bolitoglossa centenorum	+										1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Bolitoglossa cerroensis			+								1
Bolitoglossa chucantiensis				+							1
Bolitoglossa colonnea			+	+			+			+	4
Bolitoglossa compacta			+								1
Bolitoglossa conanti		+									1
Bolitoglossa copia			+								1
Bolitoglossa cuchumatana	+										1
Bolitoglossa cuna							+				1
Bolitoglossa daryorum	+										1
Bolitoglossa decora		+									1
Bolitoglossa diaphora		+									1
Bolitoglossa diminuta			+								1
Bolitoglossa dofleini	+	+			+	+					4
Bolitoglossa dunni		+									1
Bolitoglossa epimela			+								1
Bolitoglossa eremia	+										1
Bolitoglossa gomezi			+								1
Bolitoglossa gracilis			+								1
Bolitoglossa heiroreias		+									1
Bolitoglossa helmrichi	+										1
Bolitoglossa huehuetenanguensis	+										1
Bolitoglossa indio							+				1
Bolitoglossa insularis		+									1
Bolitoglossa jacksoni	+										1
Bolitoglossa jugivagans			+								1
Bolitoglossa kamuk			+								1
Bolitoglossa kaqchikelorum	+										1
Bolitoglossa la	+										1
Bolitoglossa lignicolor			+							+	2
Bolitoglossa longissima		+									1
Bolitoglossa magnifica			+								1
Bolitoglossa marmorea			+								1
Bolitoglossa meliana	+										1
Bolitoglossa minutula			+								1
Bolitoglossa mombachoensis		+									1
Bolitoglossa morio	+										1
Bolitoglossa nigrescens			+								1
Bolitoglossa ninadormida	+										1
Bolitoglossa nussbaumi	+										1
Bolitoglossa nympha	+	+				+					3
Bolitoglossa obscura			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Bolitoglossa odonnelli	+					+					2
Bolitoglossa omniumsanctorum	+										1
Bolitoglossa oresbia		+									1
Bolitoglossa pacaya	+										1
Bolitoglossa pesrubra			+								1
Bolitoglossa porrasorum		+									1
Bolitoglossa psephena	+										1
Bolitoglossa pygmaea			+								1
Bolitoglossa robinsoni			+								1
Bolitoglossa robusta			+								1
Bolitoglossa salvinii	+								+		2
Bolitoglossa schizodactyla			+				+			+	3
Bolitoglossa sombra			+								1
Bolitoglossa sooyorum			+								1
Bolitoglossa splendida			+								1
Bolitoglossa striatula		+	+			+	+		+		5
Bolitoglossa subpalmata			+								1
Bolitoglossa suchitanensis	+										1
Bolitoglossa synoria		+									1
Bolitoglossa taylori				+							1
Bolitoglossa tenebrosa	+										1
Bolitoglossa tica			+								1
Bolitoglossa tzultacaj	+										1
Bolitoglossa xibalba	+										1
Bolitoglossa zacapensis	+										1
Cryptotriton monzoni	+										1
Cryptotriton nasalis	+	+									2
Cryptotriton necopinus		+									1
Cryptotriton sierraminensis	+										1
Cryptotriton veraepacis	+										1
Cryptotriton xucaneborum	+										1
Dendrotriton bromeliacius	+										1
Dendrotriton chujorum	+										1
Dendrotriton cuchumatanus	+										1
Dendrotriton kekchiorum	+										1
Dendrotriton rabbi	+										1
Dendrotriton sanctibarbarus		+									1
Nototriton abscondens			+								1
Nototriton barbouri		+									1
Nototriton brodiei	+										1
Nototriton costaricense			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Nototriton gamezi			+								1
Nototriton guanacaste			+								1
Nototriton lignicola		+									1
Nototriton limnospectator		+									1
Nototriton major			+								1
Nototriton matama			+								1
Nototriton mime		+									1
Nototriton nelsoni		+									1
Nototriton oreadorum		+									1
Nototriton picadoi			+								1
Nototriton picucha		+									1
Nototriton richardi			+								1
Nototriton saslaya		+									1
Nototriton stuarti	+										1
Nototriton tapanti			+								1
Nototriton tomamorum		+									1
Oedipina alfaroi			+				+				2
Oedipina alleni			+							+	2
Oedipina altura			+								1
Oedipina berlini			+								1
Oedipina capitalina		+									1
Oedipina carablanca							+				1
Oedipina chortiorum		+									1
Oedipina collaris							+				1
Oedipina cyclocauda							+				1
Oedipina fortunensis			+								1
Oedipina gephyra		+									1
Oedipina gracilis							+				1
Oedipina grandis			+								1
Oedipina ignea	+	+									2
Oedipina kasios		+									1
Oedipina koehleri		+									1
Oedipina leptopoda		+									1
Oedipina maritima							+				1
Oedipina motaguae						+					1
Oedipina nica		+									1
Oedipina nimaso			+								1
Oedipina pacificensis										+	1
Oedipina paucidentata			+								1
Oedipina petiola		+									1
Oedipina poelzi			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Oedipina pseudouniformis			+				+		+		3
Oedipina quadra						+					1
Oedipina salvadorensis									+		1
Oedipina savagei			+								1
Oedipina stenopodia	+										1
Oedipina stuarti		+							+		2
Oedipina taylori		+									1
Oedipina tomasi		+									1
Oedipina tzutujilorum	+										1
Oedipina uniformis			+								1
Pseudoeurycea exspectata	+										1
Gymnophiona (7 species)											
Caecilidae (3 species)											
Caecilia volcani										+	1
Oscaecilia elongata										+	1
Oscaecilia osae										+	1
Dermophiidae (4 species)											
Dermophis costaricensis			+								1
Dermophis gracilior			+								1
Dermophis occidentalis			+							+	2
Gymnopis multiplicata		+	+			+	+			+	5
Squamata (279 Species)											
Anguidae (25 species)											
Abronia anzuetoi	+										1
Abronia aurita	+										1
Abronia campbelli	+										1
Abronia fimbriata	+										1
Abronia frosti	+										1
Abronia gaiophantasma	+										1
Abronia meledona	+										1
Abronia montecristoi		+									1
Abronia salvadorensis		+									1
Abronia vasconcelosii	+										1
Celestus adercus			+								1
Celestus atitlanensis	+	+									2
Celestus bivittatus		+									1
Celestus cyanochloris			+								1
Celestus hylaius							+				1
Celestus laf			+								1
Celestus montanus		+									1
Celestus orobius			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Celestus scansorius		+									1
Coloptychon rhombifer										+	1
Diploglossus bilobatus			+				+			+	3
Diploglossus montisilvestris				+							1
Mesaspis cuchumatanus	+										1
Mesaspis monticola			+								1
Mesaspis salvadorensis		+									1
Corytophanidae (1 species)											
Basiliscus plumifrons			+			+	+		+	+	5
Dactyloidae (74 species)											
Dactyloa brooksi			+	+			+			+	4
Dactyloa casildae			+								1
Dactyloa ginaelisae			+								1
Dactyloa ibanezi			+							+	2
Dactyloa insignis			+				+			+	3
Dactyloa kathydayae			+								1
Dactyloa kunayalae			+				+				2
Dactyloa maia				+							1
Dactyloa microtus			+								1
Dactyloa savagei			+						+		2
Norops alocomyos			+								1
Norops altae			+								1
Norops amplisquamosus		+									1
Norops apletophallus			+	+			+			+	4
Norops aquaticus			+							+	2
Norops benedikti			+								1
Norops bicaorum						+					1
Norops campbelli	+										1
Norops carpenteri		+					+				2
Norops charlesmyersi		+								+	2
Norops cobanensis	+										1
Norops cryptolimifrons			+				+				2
Norops cupreus		+	+			+	+		+	+	6
Norops cusuco		+									1
Norops datzorum			+								1
Norops elcopeensis			+							+	2
Norops fortunensis			+								1
Norops fungosus			+								1
Norops gruuo			+								1
Norops haguei	+										1
Norops heteropholidotus		+									1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Norops humilis			+	+			+			+	4
Norops intermedius			+								1
Norops johnmeyeri		+									1
Norops kemptoni			+								1
Norops kreutzi		+									1
Norops leditzigorum			+								1
Norops limifrons		+	+			+	+		+	+	6
Norops lionotus			+				+			+	3
Norops loveridgei		+				+					2
Norops macrophallus	+							+	+		3
Norops magnaphallus			+								1
Norops marsupialis			+							+	2
Norops mccraniei	+	+									2
Norops monteverde			+								1
Norops morazani		+									1
Norops muralla		+									1
Norops ocelloscapularis		+									1
Norops osa										+	1
Norops oxylophus		+	+				+			+	4
Norops pachypus			+								1
Norops pijolensis		+									1
Norops polylepis			+							+	2
Norops pseudokemptoni			+								1
Norops pseudopachypus			+								1
Norops purpurgularis		+									1
Norops quaggulus		+				+	+				3
Norops roatanensis						+					1
Norops rubribarbaris		+									1
Norops salvini			+								1
Norops sminthus		+									1
Norops tenorioensis			+								1
Norops townsendi										+	1
Norops triumphalis										+	1
Norops tropidolepis			+								1
Norops utilensis						+					1
Norops villai							+				1
Norops wampuensis						+					1
Norops wellbornae	+	+						+	+		4
Norops wermuthi		+									1
Norops wilsoni		+				+					2
Norops woodi			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	**HN**	**CRP**	**EP**	**YP**	**GH**	**NP**	**CGU**	**GCR**	**CP**	
Norops yoroensis		+									1
Norops zeus		+				+					2
Eublepharidae (1 species)											
Coleonyx mitratus		+	+			+			+	+	5
Gymnophthalmidae (3 species)											
Bachia blairi										+	1
Echinosaura panamensis			+				+			+	3
Echinosaura apodema			+							+	2
Helodermatidae (1 species)											
Heloderma charlesbogerti	+							+			2
Iguanidae (7 species)											
Ctenosaura bakeri						+					1
Ctenosaura flavidorsalis		+				+			+		3
Ctenosaura melanosterna		+				+					2
Ctenosaura oedirhina						+					1
Ctenosaura palearis	+										1
Ctenosura praeocularis		+							+		2
Ctenosaura quinquecarinata		+							+		2
Mabuyidae (4 species)											
Marisora alliacea							+				1
Marisora magnacornae							+				1
Marisora roatanae						+					1
Marisora unimarginata			+	+			+		+	+	5
Phrynosomatidae (2 species)											
Sceloporus lunaei	+					+					2
Sceloporus malachiticus		+	+			+					3
Phyllodactylidae (3 species)											
Phyllodactylus insularis						+					1
Phyllodactylus palmeus						+					1
Phyllodactylus paralepis						+					1
Scincidae (1 species)											
Mesoscincus managuae		+							+		2
Sphaerodactylidae (13 species)											
Lepidoblepharis emberawoundule				+							1
Lepidoblepharis rufigularis				+							1
Lepidoblepharis victormartinezi			+				+				2
Sphaerodactylus alphus						+					1
Sphaerodactylus dunni						+					1
Sphaerodactylus graptolaemus										+	1
Sphaerodactylus guanaje						+					1
Sphaerodactylus homolepis							+				1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Sphaerodactylus leonardovaldesi						+					1
Sphaerodactylus millepunctatus	+	+			+	+	+		+		6
Sphaerodactylus pacificus										+	1
Sphaerodactylus poindexteri						+					1
Sphaerodactylus rosaurae						+					1
Sphenomorphidae (1 species)											
Scincella rara							+				1
Teiidae (5 species)											
Cnemidophorus duellmani										+	1
Cnemidophorus ruatanus						+	+				2
Holcosus leptophrys			+	+			+			+	4
Holcosus miadis							+				1
Holcosus quadrilineatus			+	+			+			+	4
Xantusiidae (2 species)											
Lepidophyma mayae	+				+						2
Lepidophyma reticulatum			+							+	2
Anomalepididae (1 species)											
Helminthophis frontalis			+				+				2
Colubridae (30 species)											
Dendrophidion apharocybe		+	+			+	+				4
Dendrophidion crybelum			+								1
Dendrophidion paucicarinatum			+								1
Dendrophidion rufiterminorum	+	+	+			+	+				5
Drymobius melanotropis			+			+	+				3
Leptodrymus pulcherrimus		+				+		+	+		4
Leptophis nebulosus			+			+	+			+	4
Mastigodryas alternatus		+	+			+	+		+	+	6
Mastigodryas dorsalis	+	+									2
Oxybelis wilsoni						+					1
Scolecophis atrocinctus		+	+						+		3
Tantilla albiceps							+				1
Tantilla armillata	+	+	+						+		4
Tantilla bairdi	+										1
Tantilla berguidoi				+							1
Tantilla brevicauda								+	+		2
Tantilla excelsa		+				+					2
Tantilla gottei		+									1
Tantilla hendersoni	+										1
Tantilla jani	+							+			2
Tantilla lempira		+									1
Tantilla olympia		+									1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										**Totals**
	CG	**HN**	**CRP**	**EP**	**YP**	**GH**	**NP**	**CGU**	**GCR**	**CP**	
Tantilla psittaca						+					1
Tantilla ruficeps			+				+			+	3
Tantilla stenigrammi		+									1
Tantilla taeniata	+								+		2
Tantilla tecta					+						1
Tantilla tritaeniata						+					1
Tantilla vermiformis									+		1
Trimorphodon quadruplex	+	+				+	+		+		5
Dipsadidae (77 species)											
Adelphicos daryi	+										1
Adelphicos ibarrorum	+										1
Adelphicos veraepacis	+										1
Atractus darienensis										+	1
Atractus depressiocellus										+	1
Atractus hostilitractus							+				1
Atractus imperfectus				+							1
Chapinophis xanthocheilus	+										1
Coniophanes joanae				+							1
Crisantophis nevermanni		+	+					+	+		4
Cubophis brooksi						+					1
Dipsas articulata			+				+		+		3
Dipsas bicolor		+				+	+				3
Dipsas nicholsi										+	1
Dipsas tenuissima										+	1
Enulius bifoveatus						+					1
Enulius roatanensis						+					1
Geophis bellus				+							1
Geophis brachycephalus			+				+			+	3
Geophis championi			+								1
Geophis damiani		+									1
Geophis downsi			+								1
Geophis dunni		+									1
Geophis fulvoguttatus		+									1
Geophis godmani			+								1
Geophis hoffmanni		+	+			+	+		+	+	6
Geophis nephodrymus		+									1
Geophis ruthveni			+				+				2
Geophis talamancae			+								1
Geophis tectus			+				+				2
Geophis zeledoni			+								1
Hydromorphus concolor	+	+	+			+	+		+	+	7

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Hydromorphus dunni			+								1
Imantodes phantasma				+							1
Leptodeira rhombifera	+	+	+			+	+	+	+	+	8
Leptodeira rubricata										+	1
Ninia celata			+								1
Ninia espinali		+									1
Ninia maculata		+	+			+	+			+	5
Ninia pavimentata	+	+									2
Ninia psephota			+								1
Omoadiphas aurula		+									1
Omoadiphas cannula		+									1
Omoadiphas texiguatensis		+									1
Rhadinaea calligaster			+								1
Rhadinaea pulveriventris			+								1
Rhadinaea sargenti				+			+				2
Rhadinaea stadelmani	+										1
Rhadinaea vermiculaticeps			+				+			+	3
Rhadinella anachoreta	+	+			+	+					4
Rhadinella hempsteadae	+										1
Rhadinella lisyae		+									1
Rhadinella montecristi	+	+									2
Rhadinella pegosalyta		+									1
Rhadinella pilonaorum	+	+									2
Rhadinella rogerromani		+									1
Rhadinella serperaster			+								1
Rhadinella tolpanorum		+									1
Sibon anthracops	+	+							+		3
Sibon argus			+	+			+			+	4
Sibon carri	+	+							+		3
Sibon lamari							+				1
Sibon longifrenis		+	+			+	+				4
Sibon manzanaresi						+					1
Sibon merendonensis		+									1
Sibon miskitus						+					1
Sibon noalamina			+								1
Sibon perissostichon			+								1
Trimetopon barbouri			+				+			+	3
Trimetopon gracile			+								1
Trimetopon pliolepis			+				+				2
Trimetopon simile			+				+				2
Trimetopon slevini			+								1

Table 4 (continued). Distribution of the 623 endemic herpetofaunal species in Central America among the 10 physiographic regions. Abbreviations for the regions are as follows: CG = western nuclear Central American highlands; CGU = Pacific lowlands from eastern Chiapas to south-central Guatemala; CP = Pacific lowlands from central Costa Rica through Panama (area includes associated Pacific islands); CRP = Isthmian Central American highlands; EP = highlands of eastern Panama; GCR = Pacific lowlands from southeastern Guatemala to northwestern Costa Rica; GH = Caribbean lowlands of eastern Guatemala and northern Honduras (area includes associated Caribbean islands); HN = eastern nuclear Central American highlands; NP = Caribbean lowlands from Nicaragua to Panama (area includes associated Caribbean islands); and YP = Yucatan Platform. ? = species known from indeterminate locality (see text).

	Physiographic Regions of Central America										Totals
	CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP	
Trimetopon viquezi							+				1
Urotheca guentheri		+	+			+	+			+	5
Urotheca myersi			+								1
Urotheca pachyura			+				+				2
Elapidae (6 species)											
Micrurus alleni			+			+	+			+	4
Micrurus hippocrepis	+					+					2
Micrurus mosquitensis							+				1
Micrurus ruatanus						+					1
Micrurus stewarti				+			+			+	3
Micrurus stuarti	+										1
Leptotyphlopidae (3 species)											
Epictia ater	+	+	+			+			+		5
Epictia martinezi		+									1
Epictia pauldwyeri										+	1
Typhlopidae (3 species)											
Amerotyphlops costaricensis		+	+			+	+				4
Amerotyphlops stadelmani		+				+					2
Typhlops tycherus		+									1
Viperidae (16 species)											
Agkistrodon howardgloydi	+				+			+	+		4
Atropoides indomitus		+									1
Atropoides picadoi			+				+			+	3
Bothriechis guifarroi		+									1
Bothriechis lateralis			+								1
Bothriechis marchi		+									1
Bothriechis nigroviridis			+								1
Bothriechis nubestris			+								1
Bothriechis supraciliaris			+							+	2
Bothriechis thalassinus		+									1
Cerrophidion sasai			+								1
Cerrophidion wilsoni		+									1
Lachesis melanocephala			+							+	2
Lachesis stenophrys							+			+	2
Porthidium porrasi									+		1
Porthidium volcanicum										+	1
Testudines (2 species)											
Geoemydidae (1 species)											
Rhinoclemmys funerea						+	+				2
Kinosternidae (1 species)											
Kinosternon angustipons							+				1

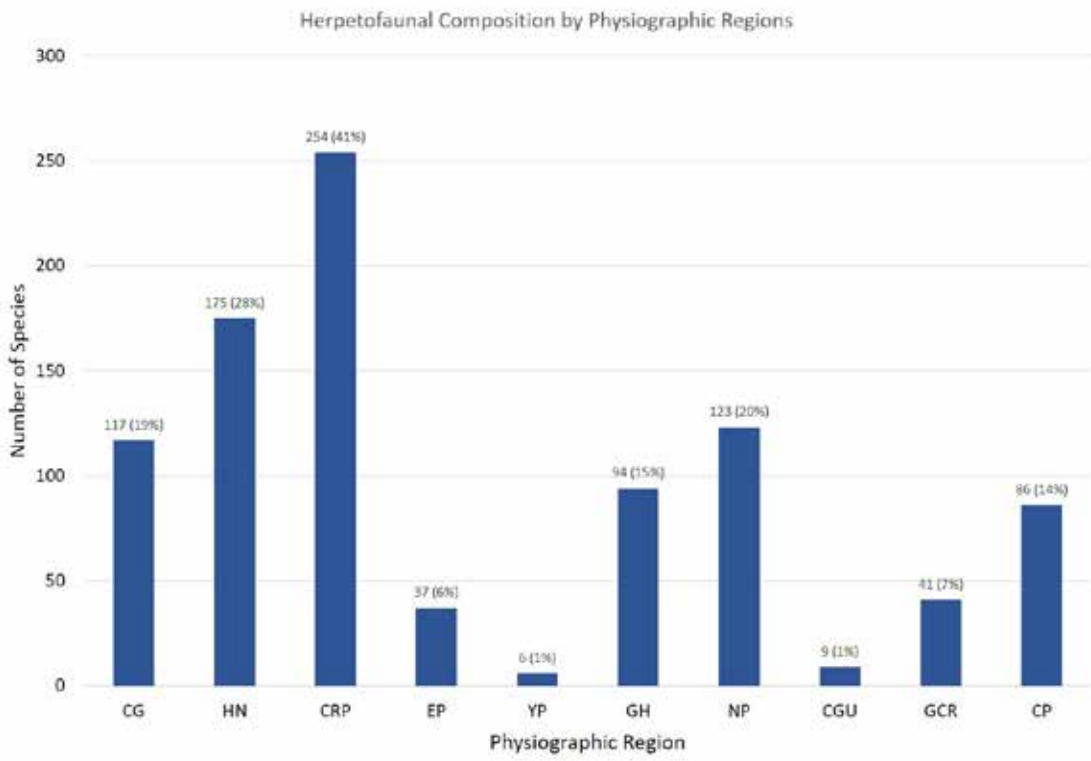

Fig. 3. Graph indicating the number and percentage of Central American endemic species in each of the 10 physiographic regions recognized.

Table 5. Distributional summary of herpetofaunal families containing priority level one species in Central America, among the 10 physiographic regions. See Table 4 for explanation of abbreviations.

Families	Number of Species	Physiographic Regions									
		CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP
Bufonidae	12	—	1	9	—	—	—	1	—	—	1
Centrolenidae	2	—	—	2	—	—	—	—	—	—	—
Craugastoridae	50	9	12	20	3	—	1	3	—	—	2
Dendrobatidae	10	—	—	2	3	—	—	4	—	—	1
Eleutherodactylidae	9	—	—	4	4	—	—	1	—	—	—
Hylidae	31	7	8	11	1	—	—	3	—	—	1
Leptodactylidae	1	—	1	—	—	—	—	—	—	—	—
Microhylidae	1	—	—	—	—	—	—	1	—	—	—
Pipidae	1	—	—	—	—	—	—	—	—	—	1
Ranidae	3	—	1	1	—	—	—	1	—	—	—
Subtotals	120	16	23	49	11	—	1	14	—	—	6
Plethodontidae	127	34	35	45	2	—	2	7	—	1	1
Subtotals	**127**	**34**	**35**	**45**	**2**	**—**	**2**	**7**	**—**	**1**	**1**
Caecilidae	3	—	—	—	—	—	—	—	—	—	3
Dermophiidae	2	—	—	2	—	—	—	—	—	—	—
Subtotals	**5**	**—**	**—**	**2**	**—**	**—**	**—**	**—**	**—**	**—**	**3**
Totals	**252**	**50**	**58**	**96**	**13**	**—**	**3**	**21**	**—**	**1**	**10**
Anguidae	23	9	6	5	1	—	—	1	—	—	1
Dactyloidae	46	2	14	22	—	—	4	1	—	—	3
Gymnophthalmidae	1	—	—	—	—	—	—	—	—	—	1

Table 5 (continued). Distributional summary of herpetofaunal families containing priority level one species in Central America, among the 10 physiographic regions. See Table 4 for explanation of abbreviations.

Families	Number of Species	Physiographic Regions									
		CG	HN	CRP	EP	YP	GH	NP	CGU	GCR	CP
Iguanidae	3	1	—	—	—	—	2	—	—	—	—
Mabuyidae	3	—	—	—	—	—	1	2	—	—	—
Phyllodactylidae	3	—	—	—	—	—	3	—	—	—	—
Sphaerodactylidae	11	—	—	—	2	—	6	1	—	—	2
Sphenomorphidae	1	—	—	—	—	—	—	1	—	—	—
Teiidae	2	—	—	—	—	—	—	1	—	—	1
Colubridae	15	2	4	2	1	1	3	1	—	1	—
Dipsadidae	48	4	13	14	4	—	5	3	—	—	5
Elapidae	3	1	—	—	—	—	1	1	—	—	—
Leptotyphlopidae	2	—	1	—	—	—	—	—	—	—	1
Typhlopidae	1	—	1	—	—	—	—	—	—	—	—
Viperidae	11	—	5	4	—	—	—	—	—	1	1
Subtotals	**173**	**19**	**44**	**47**	**8**	**1**	**25**	**12**	**—**	**2**	**15**
Kinosternidae	1	—	—	—	—	—	—	1	—	—	—
Subtotals	**1**	**—**	**—**	**—**	**—**	**—**	**—**	**1**	**—**	**—**	**—**
Totals	**174**	**19**	**44**	**47**	**8**	**1**	**25**	**13**		**2**	**15**
Sum Totals	**426**	**69**	**102**	**143**	**21**	**1**	**28**	**34**	**—**	**3**	**25**

is 94.3. Four of the regional values lie above or close to the mean figure, as follows: western nuclear Central American highlands (CG; 117), eastern nuclear Central American highlands (HN; 178), Isthmian Central American highlands (CRP; 254), Caribbean lowlands of eastern Guatemala and northern Honduras (GH; 94), and Caribbean lowlands from Nicaragua to Panama (NP; 123). Given these species numbers, the five regions with values above or close to the mean are the most significant for conservation remediation.

The other five of the regional values lie below the mean figure, as follows: highlands of eastern Panama (EP; 37), Yucatan Platform (YP; 6), Pacific lowlands from eastern Chiapas to south-central Guatemala (CGU; 9), Pacific lowlands from southeastern Guatemala to northwestern Costa Rica (GCR; 39), and Pacific lowlands from Central Costa Rica through Panama (CP; 86). Even though these values are relatively low, collectively they amount to 177 species, 28.4% of the total of 623 endemic species; thus, they also are of considerable importance.

The five regions containing the highest numbers of endemic species include three in highland and two in lowland areas. The five regions with the lowest numbers include one in highland and four in lowland areas. The numbers in the four highland regions range from 37 to 254, and in the six lowland regions from six to 86.

Obviously, the 623 Central American endemic species are distributed unevenly throughout the 10 physiographic regions we recognize. In order to examine their distribution, we constructed a table indicating the total number of regions inhabited by the component species (Table 6). The regions, listed in order of their total number of constituent species, range from six in the Yucatan Platform to 254 in the Isthmian Central American highlands. The number of physiographic regions occupied by these species ranges from one to eight, and their corresponding number of species also decreases markedly (Table 6). Thus, 450 species occupy a single region, with the numbers ranging from one in the Yucatan Platform to 154 in the Isthmian Central American highlands; no single-region species are present in the Pacific lowlands from eastern Chiapas to south-central Guatemala. At the opposite extreme, a single species (*Leptodeira rhombifera*) occupies eight regions, and one species (*Hydromorphus concolor*) inhabits seven regions. The single-region species comprise the most speciose categories for seven of the 10 physiographic regions (Table 6). The three exceptions are subhumid regions on the Atlantic (Yucatan Platform) and Pacific versants (Pacific lowlands from eastern Chiapas to south-central Guatemala and Pacific lowlands from southeastern Guatemala to northwestern Costa Rica).

The 450 single-region species comprise 72.2% of the 623 Central American endemic species. The 95 two-region species contribute 15.2% of the total number. Together, the single-region and two-region species constitute 545 taxa, 87.5% of the total. Thus, only 78 of the remaining species occupy from three to eight regions. This feature is of tremendous conservation significance for Central America, and we review this matter in greater detail below.

Conservation Status of the Endemic Central American Herpetofauna

In a previous paper on the Mexican endemic herpetofauna (Johnson et al. 2017), we utilized the Environmental Vulnerability Score (EVS) system of conservation

Plate 10. *Diasporus ventrimaculatus* Chaves, García-Rodríguez, Mora, and Leal, 2009. This frog is a priority one species "known only from the Valle del Silencio on the Caribbean versant of the Cordillera de Talamanca, Limon Province, Costa Rica" (Frost 2018). This individual was observed in Valle del Silencio, Parque Internacional La Amistad, in the province of Limón, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 11. *Duellmanohyla rufioculis* (Taylor, 1952). This treefrog is a priority one species with an EVS of 14, which ranges on both "the Caribbean and Pacific slopes of the mountains of Costa Rica" (Frost 2018). This individual came from Centro Soltis, San Isidro de Peñas Blancas, in the province of Alajuela, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 12. *Isthmohyla lancasteri* (Barbour, 1928). Lancaster's Treefrog is a priority two species with an EVS of 14, which occurs in "the Cordillera de Talamanca of Costa Rica and western Panama" (Frost 2018). This individual was found in Guayacán, in the province of Limón, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 13. *Plectrohyla pokomchi* Duellman and Campbell, 1984. The Rio Sanaja Spikethumb Frog is a priority eight species with an EVS of 13, which is distributed in "the Sierra de las Minas and the contiguous Sierra de Xucaneb in central and eastern Guatemala" (Frost 2018). This individual came from Purulhá, in the department of Baja Verapaz, Guatemala. *Photo by Andres Novales.*

Plate 14. *Ptychohyla legleri* (Taylor, 1958). Legler's Stream Frog is a priority one species with an EVS of 14, which is found on the "Pacific slopes of the Sierra de Talamanca [of] eastern Costa Rica and western Panama" (Frost 2018). This individual was located in Alfombra de Pérez Zeledón, in the province of San José, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 15. *Smilisca puma* (Cope, 1885). The Tawny Smilisca is a priority one species with an EVS of 14, distributed on the "Caribbean lowlands of Costa Rica and adjacent Nicaragua" (Frost 2018). This individual was encountered in La Selva Biological Station, in the province of Heredia, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Table 6. Number of endemic species in each of the 10 physiographic regions inhabited in Central America. See Table 4 for explanation of abbreviations.

Physiographic Regions	Number of endemic species in each physiographic region								Totals
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	
YP	1	1	—	3	—	1	—	—	**6**
CGU	—	3	1	4	—	—	—	1	**9**
EP	23	4	1	6	1	—	1	—	**36**
GCR	4	8	10	6	6	5	2	1	**42**
CP	28	20	14	9	8	4	2	1	**86**
GH	28	25	12	11	11	5	2	1	**95**
CG	77	23	6	5	3	1	1	1	**117**
NP	36	35	22	13	11	5	2	1	**125**
HN	102	32	12	11	9	5	2	1	**174**
CRP	153	40	21	16	11	4	2	1	**248**
Totals	**452**	**191**	**99**	**84**	**60**	**30**	**14**	**8**	—

assessment. Along with various other authors, we have been involved with a series of papers published on the Mesoamerican herpetofauna since 2013 (see Johnson et al. 2017, for a listing) including a recent paper on the herpetofauna of the Mexican state of Puebla (Woolrich-Piña et al. 2017). Herein, we use the same system to evaluate the conservation status of the 623 species comprising the Central American herpetofauna. In calculating the EVS for these species, we used the scores included in Johnson et al. (2015), supplemented by the scores we determined for the 43 species described since this paper was published. We placed these scores in Table 7, incorporated them into those for the entire Central American endemic herpetofauna in Table 8, and provide a graph of the data in Fig. 4.

To illustrate the pattern of distribution of the EVS, we organized these scores by family in Table 9. The data in this table indicate that the scores range from 10 to 20, out of a total theoretical range of 3 to 20. Thus, the scores occupy the entire range of medium vulnerability (10–13) and high vulnerability (14–20) in the EVS scale. None of the scores for these endemic species extend into the low vulnerability range (3–9).

The highest score of 20 is found only among the anurans and, in particular, within the family Hylidae. This score is shared by six hylid species, including four species of *Ecnomiohyla*, one of *Bromeliohyla*, and one of *Ptychohyla* (Table 8). The lowest score of 10 is seen in a broader range of herpetofaunal families (Table 9), including the Hylidae (one species), Ranidae (one), Dactyloidae (one), Phrynosomatidae (one), and Leptotyphlopidae (one). The greatest number of species, i.e., 146, were assessed an EVS of 16, with species numbers decreasing more or less gradually on either side of this apex to both extremes, i.e., 10 and 20.

Of the 623 total scores, 63 (10.1%) lie within the medium range and the remaining 560 (89.9%) in the high range (Table 9). This large representation of high vulnerability species among the endemic species is of tremendous conservation significance, and figures prominently in the system of prioritization we present below.

Priority Listing for Central American Endemic Herpetofaunal Species

In prioritizing the conservation significance of the endemic herpetofaunal species in Central America, we used the same simple system developed by Johnson et al. (2017). This system involves combining the data on physiographic distribution (Table 4) and the Environmental Vulnerability Scores (Table 8) for the 623 endemic species. This procedure resulted in the recognition of 14 priority levels, of which six are high vulnerability and eight are medium vulnerability groupings (Table 10).

We organized the high vulnerability species into six groups based on the number of physiographic regions they occupy, ranging from one to six (Table 10, Fig. 5). The numbers of species in these seven groups decrease markedly and consistently, as follows: Priority Level One (429 species); Priority Level Two (73); Priority Level Three (27); Priority Level Four (21); Priority Level Five (nine); and Priority Level Six (three). The most significant conclusion of this study is that 562 (90.2%) of the endemic species in Central America are allocated to the six high vulnerability groups. This proportion is 10 percentage points higher than the comparable figure (80.2%) for the Mexican endemic species (Johnson et al., 2017). Furthermore, we believe that the difficulty of protecting these high vulnerability species increases with the fewer physiographic regions they occupy. Thus, the most critically vulnerable species are in the Priority One grouping, the 429 species that constitute 68.9% of the total number of Central American endemics. The challenge of protecting the high vulnerability species increases commensurately with the decrease in the priority level number.

We arranged the medium vulnerability species into eight groups, also on the basis of the number of physiographic regions inhabited (Table 10, Fig. 5). Fewer species are included in these eight groups compared to the high vulnerability ones, as follows: Priority Level Seven (23); Priority Level Eight (21 species); Priority Level Nine (5); Priority Level Ten (four); Priority Level Eleven (four);

Table 7. Environmental Vulnerability Scores (EVS) for 43 endemic members of the Central American herpetofauna not included in Johnson et al. (2015) or requiring recalculation. Question marks indicate decisions made about reproductive mode based on phylogenetic relationships.

	Environmental Vulnerability Score (EVS)			
Taxa	**Geographic Distribution**	**Ecological Distribution**	**Reproductive Mode/ Degree of Persecution**	**Total Score**
Incilius majordomus	6	8	1?	15
Hyalinobatrachium dianae	5	7	3	15
Craugastor gabbi	5	8	4?	17
Diasporus dariensis	5	8	4?	17
Diasporus majeensis	6	8	4?	18
Diasporus pequeno	6	8	4?	18
Diasporus sapo	6	8	4?	18
Plectrohyla calvata	5	8	1	14
Smilisca manisorum	5	8	1?	14
Lithobates lenca	5	8	1	14
Bolitoglossa aurae	6	8	4?	18
Bolitoglossa chucutaniensis	6	8	4?	18
Cryptotriton xucaneborum	6	8	4?	18
Nototriton costaricense	6	8	4?	18
Nototriton nelson	6	7	4?	17
Nototriton oreadorum	6	8	4?	18
Oedipina berlini	5	8	4?	17
Oedipina capitalina	6	8	4?	18
Oedipina salvadorensis	5	8	4?	17
Celestus laf	6	8	3	17
Mesaspis cuchumatanus	5	7	3	15
Mesaspis salvadorensis	5	7	3	15
Dactyloa brooksi	5	7	3	15
Dactyloa kathydayae	6	8	3	17
Dactyloa maia	5	7	3	15
Dactyloa savage	5	7	3	15
Norops elcopeensis	5	7	3	15
Norops mccraniei	5	2	3	10
Norops oxylophus	5	6	3	14
Norops wilsoni	5	7	3	15
Lepidoblepharis emberawoundule	5	7	3	15
Lepidoblepharis rufigularis	6	8	3	17
Lepidoblepharis victormartinezi	5	7	3	15
Ameiva fuliginosa	5	8	3	16
Holcosus miadis	6	8	3	17
Tantilla berguidoi	6	8	2	16
Tantilla excelsa	5	6	2	13
Tantilla gottei	5	7	2	14
Tantilla stenigrammi	5	8	2	15
Rhadinella lisyae	6	7	2	15
Epictia martinezi	6	8	1	15
Epictia pauldwyeri	5	8	1	14
Bothriechis nubestris	5	7	5	17

Plate 16. *Agalychnis annae* (Duellman, 1963). The Orange-eyed Treefrog is a priority two species with an EVS of 15, with a distribution in the "Northern Cordillera de Talamanca, Cordillera de Tilarán and Cordillera Central of Costa Rica" (Frost 2018). This individual was found in Heredia, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 17. *Agalychnis saltator* Taylor, 1955. This leaf frog is a priority three species with an EVS of 14, which ranges along the "Caribbean lowlands of northeastern Honduras, Nicaragua, to east-central Costa Rica" (Frost 2018). This individual was located in Centro Soltis, San Isidro de Peñas Blancas, in the province of Alajuela, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 18. *Lithobates taylori* (Smith, 1959). The Peralta Frog is a priority eight species with an EVS of 12, distributed "at scattered localities on the humid Atlantic lowlands from eastern Nicaragua to southeastern Costa Rica and in the humid premontane and lower montane areas of upland Costa Rica, including the Meseta Oriental and Meseta Occidental and probably the Cordillera Central" (Savage 2002: 402). This individual was found in a pond at Llano Tugrí, in the Serranía de Tabasará. *Photo by Abel Batista.*

Table 8. Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Atelopus certus	14	*Oedipina ignea*	15
Atelopus chiriquiensis	14	*Oedipina kasios*	16
Atelopus chirripoensis	15	*Oedipina koehleri*	16
Atelopus limosus	14	*Oedipina leptopoda*	17
Atelopus senex	13	*Oedipina maritima*	18
Atelopus varius	11	*Oedipina motaguae*	18
Atelopus zeteki	13	*Oedipina nica*	17
Incilius aucoinae	14	*Oedipina nimaso*	18
Incilius chompipe	13	*Oedipina pacificensis*	16
Incilius epioticus	16	*Oedipina paucidentata*	18
Incilius fastidiosus	13	*Oedipina petiola*	18
Incilius guanacaste	17	*Oedipina poelzi*	16
Incilius holdridgei	14	*Oedipina pseudouniformis*	16
Incilius ibarrai	13	*Oedipina quadra*	17
Incilius karenlipsae	15	*Oedipina salvadorensis*	17
Incilius leucomyos	12	*Oedipina savagei*	18
Incilius majordomus	15	*Oedipina stenopodia*	17
Incilius melanochlorus	12	*Oedipina stuarti*	15
Incilius periglenes	15	*Oedipina taylori*	14
Incilius peripatetes	14	*Oedipina tomasi*	18
Incilius porter	14	*Oedipina tzutujilorum*	18
Incilius signifier	14	*Oedipina uniformis*	15
Rhinella centralis	14	*Pseudoeurycea exspectata*	18
Rhinella chrysophora	13	*Caecilia volcani*	17
Cochranella granulosa	15	*Oscaecilia elongata*	19
Hyalinobatrachium dianae	15	*Oscaecilia osae*	19
Hyalinobatrachium talamancae	16	*Dermophis costaricensis*	18
Hyalinobatrachium vireovittatum	16	*Dermophis gracilior*	18
Craugastor adamastus	18	*Dermophis occidentalis*	17
Craugastor anciano	16	*Gymnopis multiplicata*	14
Craugastor andi	17	*Abronia anzuetoi*	18
Craugastor angelicus	15	*Abronia aurita*	16
Craugastor aphanus	17	*Abronia campbelli*	18
Craugastor aurilegulus	15	*Abronia fimbriata*	16
Craugastor azueroensis	16	*Abronia frosti*	18
Craugastor bocourti	16	*Abronia gaiophantasma*	16
Craugastor bransfordii	13	*Abronia meledona*	18
Craugastor campbelli	16	*Abronia montecristoi*	17
Craugastor catalinae	17	*Abronia salvadorensis*	17
Craugastor chac	16	*Abronia vasconcelosii*	16
Craugastor charadra	15	*Celestus adercus*	17
Craugastor chingopetaca	18	*Celestus atitlanensis*	15
Craugastor chrysozetetes	18	*Celestus bivittatus*	15
Craugastor coffeus	18	*Celestus cyanochloris*	14
Craugastor cruzi	18	*Celestus hylaius*	16

Table 8 (continued). Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Craugastor cuaquero	18	*Celestus laf*	17
Craugastor cyanochthebius	18	*Celestus montanus*	15
Craugastor daryi	17	*Celestus orobius*	16
Craugastor emcelae	17	*Celestus scansorius*	15
Craugastor emleni	15	*Coloptychon rhombifer*	16
Craugastor epochthidius	16	*Diploglossus bilobatus*	16
Craugastor escoces	15	*Diploglossus montisilvestris*	18
Craugastor evanesce	17	*Mesaspis cuchumatanus*	15
Craugastor fecundus	16	*Mesaspis monticola*	14
Craugastor fleischmanni	16	*Mesaspis salvadorensis*	15
Craugastor gabbi	17	*Basiliscus plumifrons*	15
Craugastor gollmeri	16	*Dactyloa brooksi*	15
Craugastor gulosus	17	*Dactyloa casildae*	16
Craugastor inachus	17	*Dactyloa ginaelisae*	12
Craugastor jota	18	*Dactyloa ibanezi*	15
Craugastor laevissimus	12	*Dactyloa insignis*	14
Craugastor lauraster	16	*Dactyloa kathydayae*	17
Craugastor megacephalus	16	*Dactyloa kunayalae*	15
Craugastor melanostictus	16	*Dactyloa maia*	15
Craugastor merendonensis	18	*Dactyloa microtus*	15
Craugastor milesi	16	*Dactyloa savagei*	15
Craugastor mimus	16	*Norops alocomyos*	16
Craugastor monnichorum	16	*Norops altae*	15
Craugastor myllomyllon	18	*Norops amplisquamosus*	17
Craugastor nefrens	18	*Norops apletophallus*	15
Craugastor noblei	16	*Norops aquaticus*	15
Craugastor obesus	17	*Norops benedikti*	16
Craugastor olanchano	18	*Norops bicaorum*	17
Craugastor omoaensis	18	*Norops campbelli*	17
Craugastor pechorum	16	*Norops carpenteri*	16
Craugastor persimilis	16	*Norops charlesmyersi*	16
Craugastor phasma	18	*Norops cobanensis*	13
Craugastor podiciferus	15	*Norops cryptolimifrons*	16
Craugastor polyptychus	17	*Norops cupreus*	13
Craugastor punctariolus	16	*Norops cusuco*	17
Craugastor ranoides	15	*Norops datzorum*	15
Craugastor rayo	16	*Norops elcopeensis*	15
Craugastor rhyacobatrachus	16	*Norops fortunensis*	17
Craugastor rivulus	17	*Norops fungosus*	15
Craugastor rostralis	16	*Norops gruuo*	17
Craugastor rugosus	16	*Norops haguei*	17
Craugastor sabrinus	16	*Norops heteropholidotus*	16
Craugastor saltuarius	18	*Norops humilis*	14
Craugastor sandersoni	18	*Norops intermedius*	14
Craugastor stadelmani	16	*Norops johnmeyeri*	16

Table 8 (continued). Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Craugastor stejnegerianus	14	*Norops kemptoni*	15
Craugastor tabasarae	17	*Norops kreutzi*	17
Craugastor talamancae	17	*Norops leditzigorum*	15
Craugastor taurus	17	*Norops limifrons*	15
Craugastor trachydermus	18	*Norops lionotus*	14
Craugastor underwoodi	16	*Norops loveridgei*	14
Craugastor xucanebi	16	*Norops macrophallus*	15
Pristimantis adnus	18	*Norops magnaphallus*	17
Pristimantis altae	16	*Norops marsupialis*	16
Pristimantis caryophyllaceus	15	*Norops mccraniei*	10
Pristimantis cerasinus	16	*Norops monteverde*	17
Pristimantis museosus	17	*Norops morazani*	17
Pristimantis pardalis	17	*Norops muralla*	17
Pristimantis pirrensis	18	*Norops ocelloscapularis*	15
Strabomantis laticorpus	17	*Norops osa*	16
Ameerega maculate	18	*Norops oxylophus*	14
Andinobates claudiae	18	*Norops pachypus*	15
Andinobates geminisae	18	*Norops pijolensis*	16
Colostethus latinasus	15	*Norops polylepis*	15
Ectopoglossus astralogaster	18	*Norops pseudokemptoni*	17
Ectopoglossus isthminus	16	*Norops pseudopachypus*	17
Oophaga arborea	16	*Norops purpurgularis*	16
Oophaga granulifera	17	*Norops quaggulus*	15
Oophaga pumilio	16	*Norops roatanensis*	17
Oophaga speciosa	16	*Norops rubribarbaris*	17
Oophaga vicentei	16	*Norops salvini*	15
Phyllobates lugubris	17	*Norops sminthus*	15
Phyllobates vittatus	17	*Norops tenorioensis*	17
Silverstoneia flotator	16	*Norops townsendi*	17
Diasporus citrinobapheus	17	*Norops triumphalis*	17
Diasporus darienensis	17	*Norops tropidolepis*	15
Diasporus diastema	15	*Norops utilensis*	17
Diasporus hylaeformis	17	*Norops villai*	17
Diasporus igneus	18	*Norops wampuensis*	17
Diasporus majeensis	18	*Norops wellbornae*	15
Diasporus pequeno	18	*Norops wermuthi*	16
Diasporus sapo	18	*Norops wilsoni*	15
Diasporus tigrillo	18	*Norops woodi*	14
Diasporus ventrimaculatus	18	*Norops yoroensis*	15
Atlantihyla panchoi	13	*Norops zeus*	15
Atlantihyla spinipollex	12	*Coleonyx mitratus*	14
Bromeliohyla melacaena	20	*Bachia blairi*	15
Dryophytes bocourti	14	*Echinosaura panamensis*	14
Duellmanohyla legleri	14	*Echinosaura apodema*	15
Duellmanohyla lythrodes	14	*Heloderma charlesbogerti*	18
Duellmanohyla rufioculis	14	*Ctenosaura bakeri*	19

Table 8 (continued). Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Duellmanohyla salvadorensis	12	*Ctenosaura flavidorsalis*	18
Duellmanohyla salvavida	13	*Ctenosaura melanosterna*	18
Duellmanohyla soralia	12	*Ctenosaura oedirhina*	19
Duellmanohyla uranochroa	12	*Ctenosaura palearis*	19
Ecnomiohyla bailarina	20	*Ctenosura praeocularis*	18
Ecnomiohyla fimbrimembra	19	*Ctenosaura quinquecarinata*	19
Ecnomiohyla minera	18	*Marisora alliacea*	15
Ecnomiohyla rabborum	20	*Marisora magnacornae*	17
Ecnomiohyla salvaje	19	*Marisora roatanae*	16
Ecnomiohyla sukia	18	*Marisora unimarginata*	15
Ecnomiohyla thysanota	20	*Sceloporus lunaei*	15
Ecnomiohyla veraguensis	20	*Sceloporus malachiticus*	10
Exerodonta catracha	14	*Phyllodactylus insularis*	17
Exerodonta perkinsi	15	*Phyllodactylus palmeus*	16
Hyloscirtus colymba	13	*Phyllodactylus paralepis*	17
Isthmohyla angustilineata	13	*Mesoscincus managuae*	14
Isthmohyla calypso	16	*Lepidoblepharis emberawoundule*	15
Isthmohyla debilis	14	*Lepidoblepharis rufigularis*	17
Isthmohyla graceae	13	*Lepidoblepharis victormartinezi*	15
Isthmohyla infucata	14	*Sphaerodactylus alphus*	17
Isthmohyla insolita	17	*Sphaerodactylus dunni*	15
Isthmohyla lancasteri	14	*Sphaerodactylus graptolaemus*	16
Isthmohyla picadoi	19	*Sphaerodactylus guanaje*	17
Isthmohyla pictipes	14	*Sphaerodactylus homolepis*	16
Isthmohyla pseudopuma	13	*Sphaerodactylus leonardovaldesi*	16
Isthmohyla rivularis	13	*Sphaerodactylus millepunctatus*	15
Isthmohyla tica	13	*Sphaerodactylus pacificus*	17
Isthmohyla xanthosticta	15	*Sphaerodactylus poindexteri*	17
Isthmohyla zeteki	18	*Sphaerodactylus rosaurae*	16
Plectrohyla calvata	14	*Scincella rara*	17
Plectrohyla chrysopleura	13	*Cnemidophorus duellmani*	16
Plectrohyla dasypus	14	*Cnemidophorus ruatanus*	15
Plectrohyla exquisita	15	*Holcosus leptophrys*	16
Plectrohyla glandulosa	12	*Holcosus miadis*	17
Plectrohyla pokomchi	13	*Holcosus quadrilineatus*	16
Plectrohyla psiloderma	14	*Lepidophyma mayae*	13
Plectrohyla quecchi	13	*Lepidophyma reticulatum*	13
Plectrohyla tecunumani	14	*Helminthophis frontalis*	12
Plectrohyla teuchestes	15	*Dendrophidion apharocybe*	16
Ptychohyla dendrophasma	20	*Dendrophidion crybelum*	17
Ptychohyla hypomykter	10	*Dendrophidion paucicarinatum*	16
Quilticohyla sanctaecrucis	14	*Dendrophidion rufiterminorum*	16
Scinax altae	14	*Drymobius melanotropis*	16
Smilisca manisorum	14	*Leptodrymus pulcherrimus*	13
Smilisca puma	14	*Leptophis nebulosus*	14
Leptodactylus silvanimbus	14	*Mastigodryas alternatus*	12

Table 8 (continued). Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Hypopachus pictiventris	14	*Mastigodryas dorsalis*	14
Agalychnis annae	15	*Oxybelis wilsoni*	17
Agalychnis saltatory	14	*Scolecophis atrocinctus*	13
Pipa myersi	17	*Tantilla albiceps*	16
Lithobates juliani	12	*Tantilla armillata*	11
Lithobates lenca	14	*Tantilla bairdi*	16
Lithobates miadis	15	*Tantilla berguidoi*	16
Lithobates taylori	12	*Tantilla brevicauda*	13
Lithobates vibicarius	14	*Tantilla excelsa*	13
Lithobates warszewitschii	10	*Tantilla gottei*	14
Bolitoglossa alvaradoi	16	*Tantilla hendersoni*	16
Bolitoglossa anthracina	18	*Tantilla jani*	14
Bolitoglossa aurae	18	*Tantilla lempira*	14
Bolitoglossa aureogularis	18	*Tantilla olympia*	16
Bolitoglossa bramei	17	*Tantilla psittaca*	15
Bolitoglossa carri	18	*Tantilla ruficeps*	12
Bolitoglossa cataguana	18	*Tantilla stenigrammi*	15
Bolitoglossa celaque	17	*Tantilla taeniata*	14
Bolitoglossa centenorum	18	*Tantilla tecta*	16
Bolitoglossa cerroensis	16	*Tantilla tritaeniata*	16
Bolitoglossa chucantiensis	18	*Tantilla vermiformis*	14
Bolitoglossa colonnea	16	*Trimorphodon quadruplex*	14
Bolitoglossa compacta	17	*Adelphicos daryi*	16
Bolitoglossa conanti	16	*Adelphicos ibarrorum*	15
Bolitoglossa copia	18	*Adelphicos veraepacis*	14
Bolitoglossa cuchumatana	14	*Atractus darienensis*	16
Bolitoglossa cuna	17	*Atractus depressiocellus*	15
Bolitoglossa daryorum	17	*Atractus hostilitractus*	16
Bolitoglossa decora	18	*Atractus imperfectus*	16
Bolitoglossa diaphora	18	*Chapinophis xanthocheilus*	16
Bolitoglossa diminuta	18	*Coniophanes joanae*	15
Bolitoglossa dofleini	15	*Crisantophis nevermanni*	16
Bolitoglossa dunni	16	*Cubophis brooksi*	14
Bolitoglossa epimela	17	*Dipsas articulata*	15
Bolitoglossa eremia	18	*Dipsas bicolor*	17
Bolitoglossa gomezi	16	*Dipsas nicholsi*	15
Bolitoglossa gracilis	18	*Dipsas tenuissima*	14
Bolitoglossa heiroreias	17	*Enulius bifoveatus*	16
Bolitoglossa helmrichi	16	*Enulius roatanensis*	16
Bolitoglossa huehuetenanguensis	18	*Geophis bellus*	16
Bolitoglossa indio	17	*Geophis brachycephalus*	11
Bolitoglossa insularis	18	*Geophis championi*	16
Bolitoglossa jacksoni	18	*Geophis damiani*	16
Bolitoglossa jugivagans	18	*Geophis downsi*	16
Bolitoglossa kamuk	18	*Geophis dunni*	16

Table 8 (continued). Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Bolitoglossa kaqchikelorum	17	*Geophis fulvoguttatus*	14
Bolitoglossa la	17	*Geophis godmani*	14
Bolitoglossa lignicolor	16	*Geophis hoffmanni*	12
Bolitoglossa longissima	18	*Geophis nephodrymus*	16
Bolitoglossa magnifica	16	*Geophis ruthveni*	14
Bolitoglossa marmorea	17	*Geophis talamancae*	15
Bolitoglossa meliana	16	*Geophis tectus*	13
Bolitoglossa minutula	17	*Geophis zeledoni*	15
Bolitoglossa mombachoensis	17	*Hydromorphus concolor*	12
Bolitoglossa morio	13	*Hydromorphus dunni*	16
Bolitoglossa nigrescens	16	*Imantodes phantasma*	16
Bolitoglossa ninadormida	18	*Leptodeira rhombifera*	12
Bolitoglossa nussbaumi	18	*Leptodeira rubricata*	17
Bolitoglossa nympha	16	*Ninia celata*	15
Bolitoglossa obscura	18	*Ninia espinali*	14
Bolitoglossa odonnelli	16	*Ninia maculata*	12
Bolitoglossa omniumsanctorum	16	*Ninia pavimentata*	15
Bolitoglossa oresbia	17	*Ninia psephota*	13
Bolitoglossa pacaya	17	*Omoadiphas aurula*	16
Bolitoglossa pesrubra	15	*Omoadiphas cannula*	16
Bolitoglossa porrasorum	16	*Omoadiphas texiguatensis*	16
Bolitoglossa psephena	18	*Rhadinaea calligaster*	14
Bolitoglossa pygmaea	17	*Rhadinaea pulveriventris*	14
Bolitoglossa robinsoni	16	*Rhadinaea sargenti*	14
Bolitoglossa robusta	16	*Rhadinaea stadelmani*	13
Bolitoglossa salvinii	16	*Rhadinaea vermiculaticeps*	15
Bolitoglossa schizodactyla	15	*Rhadinella anachoreta*	14
Bolitoglossa sombra	16	*Rhadinella hempsteadae*	13
Bolitoglossa sooyorum	16	*Rhadinella lisyae*	15
Bolitoglossa splendida	18	*Rhadinella montecristi*	14
Bolitoglossa striatula	16	*Rhadinella pegosalyta*	16
Bolitoglossa subpalmata	15	*Rhadinella pilonaorum*	15
Bolitoglossa suchitanensis	18	*Rhadinella rogerromani*	16
Bolitoglossa synoria	17	*Rhadinella serperaster*	13
Bolitoglossa taylori	17	*Rhadinella tolpanorum*	16
Bolitoglossa tenebrosa	17	*Sibon anthracops*	15
Bolitoglossa tica	17	*Sibon argus*	16
Bolitoglossa tzultacaj	18	*Sibon carri*	14
Bolitoglossa xibalba	17	*Sibon lamari*	16
Bolitoglossa zacapensis	18	*Sibon longifrenis*	14
Cryptotriton monzoni	18	*Sibon manzanaresi*	15
Cryptotriton nasalis	18	*Sibon merendonensis*	16
Cryptotriton necopinus	18	*Sibon miskitus*	15
Cryptotriton sierraminensis	17	*Sibon noalamina*	15
Cryptotriton veraepacis	17	*Sibon perissostichon*	16

Table 8 (continued). Environmental Vulnerability Scores (EVS) for the endemic members of the herpetofauna of Central America.

Taxa	EVS	Taxa	EVS
Cryptotriton xucaneborum	18	*Trimetopon barbouri*	15
Dendrotriton bromeliacius	17	*Trimetopon gracile*	14
Dendrotriton chujorum	18	*Trimetopon pliolepis*	12
Dendrotriton cuchumatanus	18	*Trimetopon simile*	13
Dendrotriton kekchiorum	18	*Trimetopon slevini*	14
Dendrotriton rabbi	17	*Trimetopon viquezi*	15
Dendrotriton sanctibarbarus	18	*Urotheca guentheri*	12
Nototriton abscondens	16	*Urotheca myersi*	15
Nototriton barbouri	16	*Urotheca pachyura*	14
Nototriton brodiei	17	*Micrurus alleni*	16
Nototriton costaricense	18	*Micrurus hippocrepis*	18
Nototriton gamezi	18	*Micrurus mosquitensis*	17
Nototriton guanacaste	17	*Micrurus ruatanus*	18
Nototriton lignicola	18	*Micrurus stewarti*	17
Nototriton limnospectator	17	*Micrurus stuarti*	17
Nototriton major	18	*Epictia ater*	10
Nototriton matama	18	*Epictia martinezi*	15
Nototriton mime	18	*Epictia pauldwyeri*	14
Nototriton nelsoni	17	*Amerotyphlops costaricensis*	11
Nototriton oreadorum	18	*Amerotyphlops stadelmani*	12
Nototriton picadoi	16	*Typhlops tycherus*	14
Nototriton picucha	18	*Agkistrodon howardgloydi*	17
Nototriton richardi	16	*Atropoides indomitus*	18
Nototriton saslaya	18	*Atropoides picadoi*	16
Nototriton stuarti	18	*Bothriechis guifarroi*	19
Nototriton tapanti	18	*Bothriechis lateralis*	16
Nototriton tomamorum	18	*Bothriechis marchi*	16
Oedipina alfaroi	16	*Bothriechis nigroviridis*	17
Oedipina alleni	16	*Bothriechis nubestris*	17
Oedipina altura	18	*Bothriechis supraciliaris*	17
Oedipina berlini	17	*Bothriechis thalassinus*	17
Oedipina capitalina	18	*Cerrophidion sasai*	16
Oedipina carablanca	18	*Cerrophidion wilsoni*	15
Oedipina chortiorum	18	*Lachesis melanocephala*	17
Oedipina collaris	17	*Lachesis stenophrys*	17
Oedipina cyclocauda	15	*Porthidium porrasi*	18
Oedipina fortunensis	18	*Porthidium volcanicum*	18
Oedipina gephyra	17	*Rhinoclemmys funerea*	16
Oedipina gracilis	16	*Kinosternon angustipons*	16
Oedipina grandis	17		

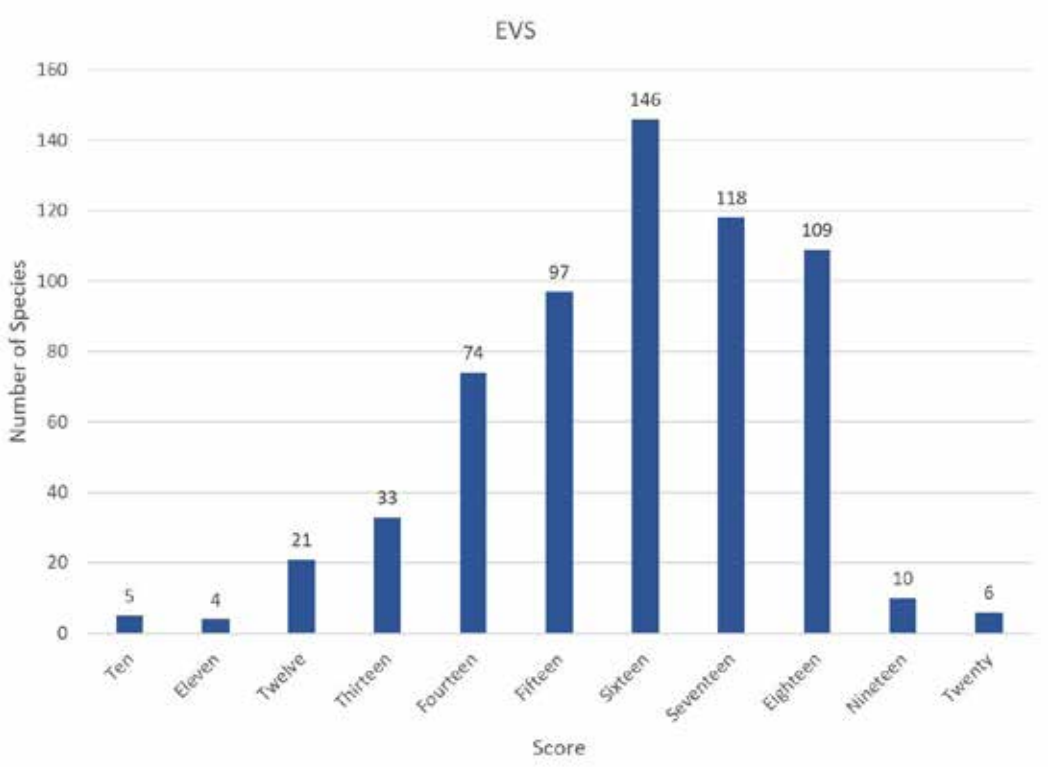

Fig. 4. Graph showing Central American endemic species and their corresponding Environmental Vulnerability Scores (EVS) ranging from 10 to 20.

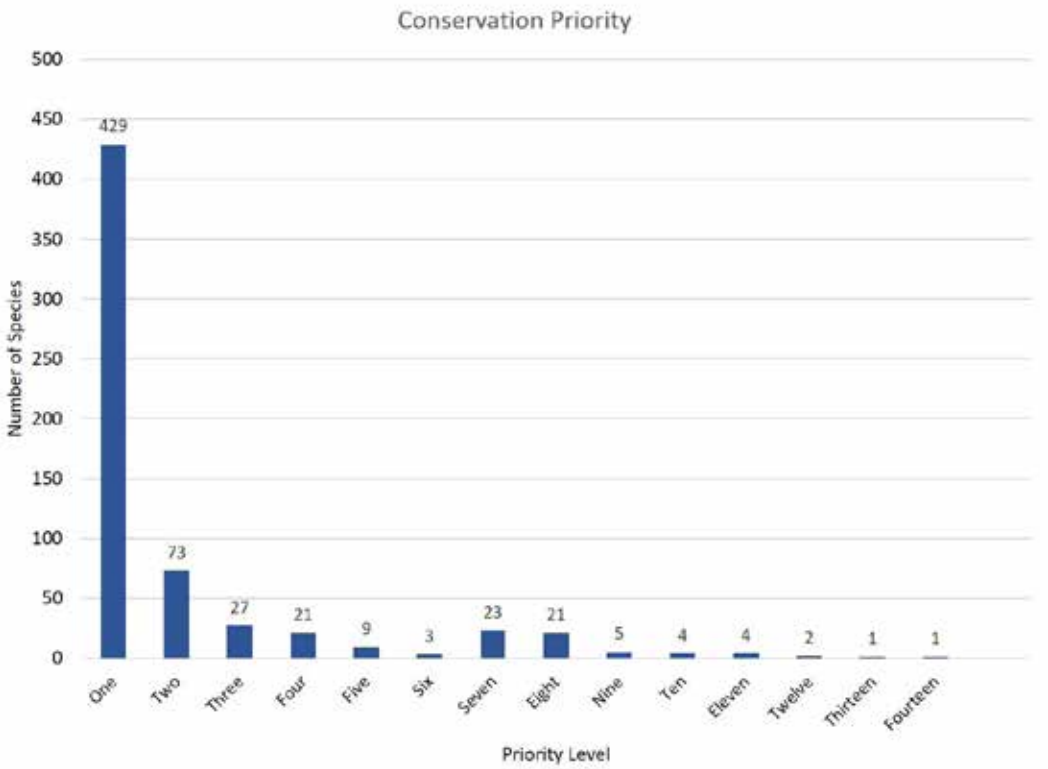

Fig. 5. Graph of Central American endemic species allocated to the 14 conservation priority groups.

Priority Level Twelve (two); Priority Level Thirteen (one); and Priority Level Fourteen (one). Even so, the next most important conclusion of this study is that these 61 species make up 9.8% of the total compendium of endemic species in Central America. The number of species in these eight groups also decreases sharply, as 69.8% of the 61 species fall into the first two priority levels, i.e., Seven and Eight.

When we examined the 623 endemic species relative to the number of physiographic regions inhabited, the results are as follows: one region (429+23 = 452); two regions (73+21 = 94); three regions (27+5 = 32); four regions (21+4 = 25); five regions (9+4 = 13); six regions (3+2 = 5); seven regions (1); and eight regions (1). Perusal of these data supports another conclusion, i.e., that 72.6% of the total number of species occupy a single physiographic region. Based on the assumptions of this study, these 452 species can be expected to offer the major challenge in efforts to protect the endemic component of the Central American herpetofauna. The next most challenging group contains the 94 species occupying two regions. Together, the single-group and double-group species comprise 546 (87.6%) of the total of 623 Central American endemic species.

Our analysis in this paper indicates that most of the 623 endemic Central American herpetofaunal species are judged as high vulnerability based on the EVS methodology, and are demonstrated to occupy relatively few physiographic regions (one or two). The endemic component of the Central American herpetofauna, just as with the Mexican endemic component (Johnson et al. 2017), is of global significance and constitutes the most significant challenge to conservation professionals working within this segment of the Mesoamerican herpetofauna. Johnson et al. (2017) arrived at the same conclusion in their work on the Mexican endemic herpetofauna. Considered as a whole, the Mesoamerican endemic herpetofauna comprises the 789 Mexican endemic species dealt with by Johnson et al. (2017) and the 623 Central American endemic species dealt with here, as well as the 225 species restricted in distribution to Mexico and Central America (i.e., Mesoamerica; Wilson et al., 2017) for a total of 1,637 species. This figure represents more than three quarters of the entire Mesoamerican herpetofauna (Wilson et al., 2017). We examine the parameters of the challenge facing conservation biologists working in Central America in the following section.

Prognosis for the Endemic Central American Herpetofauna

The same environmental issues impacting the Mexican endemic herpetofauna, as discussed by Johnson et al. (2017), also impinge upon the Central American endemic herpetofauna. In light of this situation, we emphasize that the survival of the 623 endemic species inhabiting Central America ultimately depends on addressing the underlying issues that lead to all environmental problems, including biodiversity decline, that in turn stand in the way of designing a sustainable existence for humanity's tenure on Earth. Johnson et al. (2017: 609) explained what we face as follows: "Fundamentally, humans have created and maintain these environmental problems because of their capacity for rational thought, i.e., their ability to connect cause to effect through the passing of time, and adopting an anthropocentric worldview that stresses the exploitation of the world's resources to support the burgeoning human population. Such a worldview contrasts markedly with that of environmentalists, who have adopted 'a worldview that helps us make sense of how the environment works, our place in the environment, and right and wrong environmental behaviors' (Raven and Berg 2004: G-6). Obviously, the present anthropocentric worldview held by most people represents the fundamental reason why these environmental problems exist, and continued human population growth allows them to worsen over time."

The anthropocentric worldview, also known as the Western worldview, "includes human superiority and dominance over nature, the unrestricted use of natural resources, increased economic growth to manage an expanding industrial base, the inherent rights of individuals, and accumulation of wealth and unlimited consumption of goods and services to provide material comforts" (Raven and Berg 2004: 17). This worldview not only creates the entire spectrum of environmental problems, but also the entire panoply of human societal issues we see played out every day in various media outlets. Ultimately, they arise from a commitment to discriminate among groups of people, i.e., on the basis of racial background, gender, religion, economic wealth, political persuasion, and so forth. Thus, not only is humanity poised against the rest of the living world, but also varying groups of humans are in conflict with one another. As the focus of humanity decreases from larger to increasingly smaller realms of interest, it can be argued that mental stability gives way to instability, and eventually gives rise to the increased incidence of the narcissistic personality disorder (NPD). This disorder is highly variable in presentation and can manifest across a broad spectrum of severity, but is generally characterized by pervasive grandiosity, an excessive need for admiration, and a lack of empathy (Caligor et al. 2015). Envisioning NPD as an extreme end-point of the intensification of anthropocentrism might explain why the potential causes of this disorder remain unknown and that clinical guidelines have yet to emerge (Caligor et al. 2015). Given that none of the authors of this paper possesses credentials in psychology or psychiatry, our idea about the connection between the anthropocentric worldview and the narcissistic personality disorder can be best understood as a hypothesis remaining to be tested, hopefully by a cross-discipline team of environmental scientists, deep ecology philosophers, and biocentric psychologists/psychiatrists. Studying such a connection could lie within the realm of environmental psychology, defined as an interdisciplinary field that focuses on the interplay between environments and human cognition and behavior; considering the term "environment" broadly, including both natural and human-

Table 9. Summary of EVS values for Central American endemic species, arranged by family. Shaded area encompasses high vulnerability scores.

Families	Number of Species	Environmental Vulnerability Scores										
		10	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Bufonidae	24	—	1	2	6	9	4	1	1	—	—	—
Centrolenidae	4	—	—	—	—	—	2	2	—	—	—	—
Craugastoridae	77	—	—	1	1	1	8	29	18	19	—	—
Dendrobatidae	14	—	—	—	—	—	1	6	3	4	—	—
Eleutherodactyludae	10	—	—	—	—	—	1	—	3	6	—	—
Hylidae	52	1	—	5	11	17	4	1	1	3	3	6
Leptodactylidae	1	—	—	—	—	1	—	—	—	—	—	—
Microhylidae	1	—	—	—	—	1	—	—	—	—	—	—
Phyllomedusidae	2	—	—	—	—	1	1	—	—	—	—	—
Pipidae	1	—	—	—	—	—	—	—	1	—	—	—
Ranidae	6	1	—	2	—	2	1	—	—	—	—	—
Subtotals	**192**	**2**	**1**	**10**	**18**	**32**	**22**	**39**	**27**	**32**	**3**	**6**
Plethodontidae	143	—	—	—	1	2	8	33	38	61	—	—
Subtotals	**143**	**—**	**—**	**—**	**1**	**2**	**8**	**33**	**38**	**61**	**—**	**—**
Caeciliidae	3	—	—	—	—	—	—	—	1		2	—
Dermophiidae	4	—	—	—	—	1	—	—	1	2	—	—
Subtotals	**7**	**—**	**—**	**—**	**—**	**1**	**—**	**—**	**2**	**2**	**2**	**—**
Totals	**342**	**2**	**1**	**10**	**19**	**35**	**30**	**72**	**67**	**95**	**5**	**6**
Anguidae	25	—	—	—	—	2	6	8	4	5	—	—
Corytophanidae	1	—	—	—	—	—	1	—	—	—	—	—
Dactyloidae	74	1	—	1	2	7	27	13	23	—	—	—
Eublepharidae	1	—	—	—	—	1	—	—	—	—	—	—
Gymnophthalmidae	3	—	—	—	—	1	2	—	—	—	—	—
Helodermatidae	1	—	—	—	—	—	—	—	—	1	—	—
Iguanidae	7	—	—	—	—	—	—	—	—	3	4	—
Mabuyidae	4	—	—	—	—	—	2	1	1	—	—	—
Phrynosomatidae	2	1	—	—	—	—	1	—	—	—	—	—
Phyllodactylidae	3	—	—	—	—	—	—	1	2	—	—	—
Scincidae	1	—	—	—	—	1	—	—	—	—	—	—
Sphaerodactylidae	13	—	—	—	—	—	4	4	5	—	—	—
Sphenomorphidae	1	—	—	—	—	—	—	—	1	—	—	—
Teiidae	5	—	—	—	—	—	1	3	1	—	—	—
Xantusiidae	2	—	—	—	2	—	—	—	—	—	—	—
Subtotals	**143**	**2**	**—**	**1**	**4**	**12**	**44**	**30**	**37**	**9**	**4**	**—**
Anomalepididae	1	—	—	1	—	—	—	—	—	—	—	—
Colubridae	30	—	1	2	4	8	2	11	2	—	—	—
Dipsadidae	77	—	1	6	6	17	19	26	2	—	—	—
Elapidae	6	—	—	—	—	—	—	1	3	2	—	—
Leptotyphlopidae	3	1	—	—	—	1	1	—	—	—	—	—
Typhlopidae	3	—	1	1	—	1	—	—	—	—	—	—
Viperidae	16	—	—	—	—	—	1	4	7	3	1	
Subtotals	**136**	**1**	**3**	**10**	**10**	**27**	**23**	**42**	**14**	**5**	**1**	
Geoemydidae	1	—	—	—	—	—	—	1	—	—	—	—

Table 9 (continued). Summary of EVS values for Central American endemic species, arranged by family. Shaded area encompasses high vulnerability scores.

Families	Number of Species	Environmental Vulnerability Scores										
		10	11	12	13	14	15	16	17	18	19	20
Kinosternidae	1	—	—	—	—	—	—	1	—	—	—	—
Subtotals	**2**	—	—	—	—	—	—	**2**	—	—	—	—
Totals	**281**	**3**	**3**	**11**	**14**	**39**	**67**	**74**	**51**	**14**	**5**	—
Sum Totals	**623**	**5**	**4**	**21**	**33**	**74**	**97**	**146**	**118**	**109**	**10**	**6**
Category Totals	**623**	**63**				**560**						

Plate 19. *Lithobates warszewitschii* (Schmidt, 1857). Warszewitsch's Frog is a priority eleven species with an EVS of 10, found on "the Atlantic versant from northeastern Honduras to central Panama, both slopes of the cordilleras of Costa Rica and western Panama, lowlands of southwestern Costa Rica, and eastern Panama and gallery forests in nonpeninsular northwestern Costa Rica" (Savage 2002: 405). This individual came from Nectandra Reserve, in the province of Alajuela, Costa Rica. *Photo by Sean Michael Rovito.*

Plate 20. *Bolitoglossa alvaradoi* Taylor, 1954. The Moravia de Chirripó Salamander is a priority two species with an EVS of 16, distributed on "the Atlantic versant of Costa Rica" (Frost, 2018). This individual was found in Veragua Rainforest , in the province of Limón, Costa Rica. P*hoto by Víctor Acosta-Chaves.*

Plate 21. *Bolitoglossa centenorum* Campbell, Smith, Streicher, Acevedo, and Brodie, 2010. This salamander is a priority one species with an EVS of 18, which is known "only from the type locality in the Sierra Cuchumatanes, Huehuetenango, Guatemala" (Frost 2018). This individual was encountered at the type locality, near San Mateo Ixtatán. *Photo by Todd Pierson.*

made environments (De Young 2013). Since its conception, research in environmental psychology has often targeted human attitudes towards the natural environment, and current trends are now shifting to a focus on sustainable living in the context of environmental issues (De Young 2013).

Finding lasting solutions to environmental problems must be based on a realistic, fact-based approach that evaluates the symptoms of these problems until their causes are identified (Wilson and McCranie 2004). Often, the search for an ultimate cause stops when exposed to the anthropocentric worldview. A worldview, however, is a collection of basic values that "help us to make sense of the world, understand our place in it, and determine right and wrong behaviors" (Raven and Berg 2004: G-17). How the values that characterize the anthropocentric worldview have arisen through the evolution of human behavior to become predominant, however, generally has not been explored. Our working assumption, i.e., our hypothesis, is that the ultimate causes are deeply engrained in the origins of human behavior and have become so pervasive as to underlie our efforts to understand our world, and our place in it. Even a discipline called environmental psychology might not expose the steps in behavioral evolution that would allow present-day humans to address the malady known as the anthropocentric worldview. In particular, this viewpoint is evident when considering that environmental psychology adopts a broad array of theories, methods, and interpretations from other disciplines as needed, and this mosaic approach can make it difficult to understand the field as a whole and the role it might play in these societal issues moving forward. An encouraging sign is the recent emergence of even more specific sub-fields, such as conservation psychology and ecopsychology, which aim to provide solutions or interventions for problems specifically related to conservation of the natural world (Steg and Vlek 2009; De Young 2013).

There is clearly a critical need to develop novel approaches for studying animal behavior and human psychology that emphasize reasons why the anthropocentric worldview has become so predominant, and what needs to be done to replace it with the environmental worldview. If, as we hypothesized, there is a psychological connection among centrist forms of thinking at larger scales (i.e., the anthropocentric worldview) and those at smaller scales (i.e., narcissism), then we are faced with an even greater challenge than commonly is envisioned.

Searching for Ultimate Solutions

Johnson et al. (2017: 613) offered some ideas about searching for ultimate solutions to the problem of biodiversity decline, based on opinions promulgated by Wilson and Townsend (2010), Wilson (2016), and Kopnina (2016), and concluded as follows: "Our opinion is that humans have the rational capacity to design a sustainable world through cooperative action, but our species' attitudes and actions will have to change. Our preparedness will have to improve as well. Such change will have to be based on realistic, fact-based appraisals of where we are now and where we want to be in the future. Biologists will have to commit to helping the rest of us understand why the protection of biodiversity is critical to enjoying a sustainable world. Cultural anthropologists also will have to assist humanity at large to understand why the maintenance of cultural diversity also is essential to living sustainably. Educational reform will have to be central to such efforts, to help people learn how to think and act critically and base decisions on the way things really are, and not how we might wish them to be by denying reality. The devotion humans have for structuring beliefs on the basis of little or no evidence, essentially reversing the benefit of rationality, will have to surrender to critical-thinking education established by top-to-bottom educational reform."

Critical-thinking educational reform, however, is much easier to conceive than to bring into reality. A fundamental question is why such reform has not been undertaken. This question is not easy to answer, but perhaps the most fundamental reason is that the educational systems currently in existence are products of the anthropocentric worldview and reflect its mindsets. These educational systems also have developed within the current economic systems responsible for the huge disparities between the rich and poor, and act to reinforce these disparities.

Ultimate solutions will emerge only from a clear understanding of the evolution of human psychology, as confronted with the problems we face. If not, then the endemic herpetofauna of Central America, as well as the remainder of life on Earth, will become casualties of the biodiversity crisis that eventually will envelop all humanity.

Conclusions and Recommendations

Conclusions

A. As concluded by Johnson et al. (2017), life on Earth exists as a result of the interplay among the planet's three abiotic spheres, the atmosphere, hydrosphere, and lithosphere.

B. Environmental problems and the biodiversity crisis exist because of the impact of humans on all of the planetary spheres, including the biosphere, and extend along their existing energy and materials pathways.

C. The biodiversity crisis impacts all life across the globe, and all levels of its organization.

D. The endemic component of the Central American herpetofauna is of global significance, and its importance increases with the addition of new information. Forty-three species have been added to this component within the last two years, bringing the total to 623 species.

E. The percentage of endemism of the Central American herpetofauna is 56.9, compared to 61.1 in Mexico, the other major portion of Mesoamerica.

Plate 22. *Bolitoglossa conanti* McCranie and Wilson, 1993. Conant's Mushroomtongue Salamander is a priority one species with an EVS of 16, with a distribution "on the Atlantic and Pacific versants in western Honduras and eastern Guatemala" (Townsend and Wilson 2008). This individual came from Aldea San Joaquin, in the department of Copán, Honduras. *Photo by Sean Michael Rovito.*

Plate 23. *Bolitoglossa cuchumatana* (Stuart, 1943). The Oak Forest Salamander is a priority one species with an EVS of 14, which is found in the "departments of El Quiché and Huehuetenango in the Sierra de Cuchumatanes, Guatemala" (Frost, 2018). This individual came from near Laguna Maxbal, in the department of Huehuetenango, Guatemala. *Photo by Todd Pierson.*

Plate 24. *Bolitoglossa diaphora* McCranie and Wilson, 1995. The Cusuco Salamander is a priority one species with an EVS of 18, which ranges on "the Atlantic versant in northwestern Honduras" (Townsend and Wilson 2008). This individual was found in Parque Nacional Cusuco, in the department of Cortés, Honduras. *Photo by Sean Michael Rovito.*

Plate 25. *Bolitoglossa subpalmata* (Boulenger, 1896). This salamander is a priority one species with an EVS of 15, which occurs "on both slopes of the Cordillera de Guanacaste, Cordillera de Tilarán, Cordillera Central, and their outliers in central to northern Costa Rica" (Frost 2018). This individual was encountered in Volcán Barva, Parque Nacional Braulio Carrillo, in the province of, Heredia, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 26. *Oedipina koehleri* Sunyer, Townsend, Wake, Travers, Gonzalez, Obando, and Quintana, 2011. This worm salamander is a priority one species with an EVS of 16, restricted to "three highland areas in northern Nicaragua" (Frost 2018). This individual came from Reserva Natural Cerro Musún, in the department of Matagalpa, Nicaragua. *Photo by Javier Sunyer.*

Plate 27. *Coloptychon rhombifer* (Peters, 1876). The Isthmian Alligator Lizard is a priority one species with an EVS of 16, distributed from "southwestern Costa Rica and adjacent western Panama (Savage, 2002: 533). This individual was found in San Juan de Rincón, Península de Osa, in the province of Puntarenas, Costa Rica. *Photo by César Barrio-Amorós.*

Table 10. Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Priority One: High Vulnerability Species in Single Physiographic Region (429 species)	
Atelopus chiriquiensis	*Nototriton tapanti*
Atelopus chirripoensis	*Nototriton tomamorum*
Atelopus limosus	*Oedipina altura*
Incilius aucoinae	*Oedipina berlini*
Incilius epioticus	*Oedipina capitalina*
Incilius guanacaste	*Oedipina carablanca*
Incilius holdridgei	*Oedipina chortiorum*
Incilius karenlipsae	*Oedipina collaris*
Incilius majordomus	*Oedipina cyclocauda*
Incilius periglenes	*Oedipina fortunensis*
Incilius peripatetes	*Oedipina gephyra*
Incilius porteri	*Oedipina gracilis*
Hyalinobatrachium talamancae	*Oedipina grandis*
Hyalinobatrachium vireovittatum	*Oedipina kasios*
Craugastor adamastus	*Oedipina koehleri*
Craugastor anciano	*Oedipina leptopoda*
Craugastor andi	*Oedipina maritima*
Craugastor angelicus	*Oedipina motaguae*
Craugastor aphanus	*Oedipina nica*
Craugastor azueroensis	*Oedipina nimaso*
Craugastor bocourti	*Oedipina pacificensis*
Craugastor catalinae	*Oedipina paucidentata*
Craugastor chingopetaca	*Oedipina petiola*
Craugastor chrysozetetes	*Oedipina poelzi*
Craugastor coffeus	*Oedipina quadra*
Craugastor cruzi	*Oedipina salvadorensis*
Craugastor cuaquero	*Oedipina savagei*
Craugastor cyanochthebius	*Oedipina stenopodia*
Craugastor daryi	*Oedipina taylori*
Craugastor emcelae	*Oedipina tomasi*
Craugastor emleni	*Oedipina tzutujilorum*
Craugastor escoces	*Oedipina uniformis*
Craugastor fleischmanni	*Pseudoeurycea exspectata*
Craugastor gabbi	*Caecilia volcani*
Craugastor gulosus	*Oscaecilia elongata*
Craugastor inachus	*Oscaecilia osae*
Craugastor jota	*Dermophis costaricensis*
Craugastor melanostictus	*Dermophis gracilior*
Craugastor merendonensis	*Abronia anzuetoi*
Craugastor milesi	*Abronia aurita*
Craugastor monnichorum	*Abronia campbelli*
Craugastor myllomyllon	*Abronia fimbriata*
Craugastor nefrens	*Abronia frosti*
Craugastor olanchano	*Abronia gaiophantasma*
Craugastor omoaensis	*Abronia meledona*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Craugastor phasma	*Abronia montecristoi*
Craugastor podiciferus	*Abronia salvadorensis*
Craugastor polyptychus	*Abronia vasconcelosii*
Craugastor punctariolus	*Celestus adercus*
Craugastor rayo	*Celestus bivittatus*
Craugastor rhyacobatrachus	*Celestus cyanochloris*
Craugastor rivulus	*Celestus hylaius*
Craugastor saltuarius	*Celestus laf*
Craugastor stadelmani	*Celestus montanus*
Craugastor tabasarae	*Celestus orobius*
Craugastor talamancae	*Celestus scansorius*
Craugastor taurus	*Coloptychon rhombifer*
Craugastor trachydermus	*Diploglossus montisilvestris*
Craugastor underwoodi	*Mesaspis cuchumatanus*
Craugastor xucanebi	*Mesaspis monticola*
Pristimantis adnus	*Mesaspis salvadorensis*
Pristimantis museosus	*Dactyloa casildae*
Pristimantis pirrensis	*Dactyloa kathydayae*
Strabomantis laticorpus	*Dactyloa microtus*
Ameerega maculata	*Norops alocomyos*
Andinobates claudiae	*Norops altae*
Andinobates geminisae	*Norops amplisquamosus*
Colostethus latinasus	*Norops benedikti*
Ectopoglossus astralogaster	*Norops bicaorum*
Ectopoglossus isthminus	*Norops campbelli*
Oophaga arborea	*Norops cusuco*
Oophaga pumilio	*Norops datzorum*
Oophaga speciosa	*Norops fortunensis*
Phyllobates lugubris	*Norops fungosus*
Phyllobates vittatus	*Norops gruuo*
Diasporus citrinobapheus	*Norops haguei*
Diasporus darienensis	*Norops heteropholidotus*
Diasporus hylaeformis	*Norops intermedius*
Diasporus igneus	*Norops johnmeyeri*
Diasporus majeensis	*Norops kemptoni*
Diasporus pequeno	*Norops kreutzi*
Diasporus sapo	*Norops leditzigorum*
Diasporus tigrillo	*Norops magnaphallus*
Diasporus ventrimaculatus	*Norops marsupialis*
Bromeliohyla melacaena	*Norops monteverde*
Dryophytes bocourti	*Norops morazani*
Duellmanohyla legleri	*Norops muralla*
Duellmanohyla lythrodes	*Norops ocelloscapularis*
Duellmanohyla rufioculis	*Norops osa*
Ecnomiohyla minera	*Norops pachypus*
Ecnomiohyla rabborum	*Norops pijolensis*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Ecnomiohyla salvaje	*Norops pseudokemptoni*
Ecnomiohyla thysanota	*Norops pseudopachypus*
Ecnomiohyla veraguensis	*Norops purpurgularis*
Exerodonta catracha	*Norops roatanensis*
Exerodonta perkinsi	*Norops rubribarbaris*
Isthmohyla calypsa	*Norops salvini*
Isthmohyla debilis	*Norops sminthus*
Isthmohyla infucata	*Norops tenorioensis*
Isthmohyla insolita	*Norops townsendi*
Isthmohyla picadoi	*Norops triumphalis*
Isthmohyla pictipes	*Norops tropidolepis*
Isthmohyla xanthosticta	*Norops utilensis*
Isthmohyla zeteki	*Norops villai*
Plectrohyla calvata	*Norops wampuensis*
Plectrohyla dasypus	*Norops wermuthi*
Plectrohyla exquisita	*Norops woodi*
Plectrohyla psiloderma	*Norops yoroensis*
Plectrohyla tecunumani	*Bachia blairi*
Plectrohyla teuchestes	*Potamites apodemus*
Ptychohyla dendrophasma	*Ctenosaura bakeri*
Quilticohyla sanctaecrucis	*Ctenosaura oedirhina*
Scinax altae	*Ctenosaura palearis*
Smilisca manisorum	*Marisora alliacea*
Smilisca puma	*Marisora magnacornae*
Leptodactylus silvanimbus	*Marisora roatanae*
Hypopachus pictiventris	*Phyllodactylus insularis*
Pipa myersi	*Phyllodactylus palmeus*
Lithobates lenca	*Phyllodactylus paralepis*
Lithobates miadis	*Lepidoblepharis rufigularis*
Lithobates vibicarius	*Lepidoblepharis victormartinezi*
Bolitoglossa anthracina	*Sphaerodactylus alphus*
Bolitoglossa aurae	*Sphaerodactylus dunni*
Bolitoglossa aureogularis	*Sphaerodactylus graptolaemus*
Bolitoglossa bramei	*Sphaerodactylus guanaje*
Bolitoglossa carri	*Sphaerodactylus homolepis*
Bolitoglossa cataguana	*Sphaerodactylus leonardovaldesi*
Bolitoglossa celaque	*Sphaerodactylus pacificus*
Bolitoglossa centenorum	*Sphaerodactylus poindexteri*
Bolitoglossa cerroensis	*Sphaerodactylus rosaurae*
Bolitoglossa chucantiensis	*Scincella rara*
Bolitoglossa compacta	*Cnemidophorus duellmani*
Bolitoglossa conanti	*Holcosus miadis*
Bolitoglossa copia	*Dendrophidion paucicarinatum*
Bolitoglossa cuchumatana	*Oxybelis wilsoni*
Bolitoglossa cuna	*Tantilla albiceps*
Bolitoglossa daryorum	*Tantilla bairdi*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Bolitoglossa decora	*Tantilla berguidoi*
Bolitoglossa diaphora	*Tantilla gottei*
Bolitoglossa diminuta	*Tantilla hendersoni*
Bolitoglossa dunni	*Tantilla lempira*
Bolitoglossa epimela	*Tantilla olympia*
Bolitoglossa eremia	*Tantilla psittaca*
Bolitoglossa gomezi	*Tantilla stenigrammi*
Bolitoglossa gracilis	*Tantilla tecta*
Bolitoglossa heiroreias	*Tantilla tritaeniata*
Bolitoglossa helmrichi	*Tantilla vermiformis*
Bolitoglossa huehuetenanguensis	*Adelphicos daryi*
Bolitoglossa indio	*Adelphicos ibarrorum*
Bolitoglossa insularis	*Adelphis veraepacis*
Bolitoglossa jacksoni	*Atractus dariensis*
Bolitoglossa jugivagans	*Atractus depressiocellus*
Bolitoglossa kamuk	*Atractus hostilitractus*
Bolitoglossa kaqchikelorum	*Atractus imperfectus*
Bolitoglossa la	*Chapinophis xanthocheilus*
Bolitoglossa longissima	*Coniophanes joanae*
Bolitoglossa magnifica	*Cubophis brooksi*
Bolitoglossa marmorea	*Dipsas nicholsi*
Bolitoglossa meliana	*Dipsas tenuissima*
Bolitoglossa minutula	*Enulius bifoveatus*
Bolitoglossa mombachoensis	*Enulius roatanensis*
Bolitoglossa nigrescens	*Geophis bellus*
Bolitoglossa ninadormida	*Geophis championi*
Bolitoglossa nussbaumi	*Geophis damiani*
Bolitoglossa obscura	*Geophis downsi*
Bolitoglossa omniumsanctorum	*Geophis dunni*
Bolitoglossa oresbia	*Geophis fulvoguttatus*
Bolitoglossa pacaya	*Geophis godmani*
Bolitoglossa pesrubra	*Geophis nephodrymus*
Bolitoglossa porrasorum	*Geophis talamancae*
Bolitoglossa psephena	*Geophis zeledoni*
Bolitoglossa pygmaea	*Hydromorphus dunni*
Bolitoglossa robinsoni	*Imantodes phantasma*
Bolitoglossa robusta	*Leptodeira rubricata*
Bolitoglossa sombra	*Ninia celata*
Bolitoglossa sooyorum	*Ninia espinali*
Bolitoglossa splendida	*Omoadiphas aurula*
Bolitoglossa subpalmata	*Omoadiphas cannula*
Bolitoglossa suchitanensis	*Omoadiphas texiguatensis*
Bolitoglossa synoria	*Rhadinaea calligaster*
Bolitoglossa taylori	*Rhadinaea pulveriventris*
Bolitoglossa tenebrosa	*Rhadinella lisyae*
Bolitoglossa tica	*Rhadinella pegosalyta*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Bolitoglossa tzultacaj	*Rhadinella pilonaorum*
Bolitoglossa xibalba	*Rhadinella rogerromani*
Bolitolossa zacapensis	*Rhadinella tolpanorum*
Cryptotriton monzoni	*Sibon lamari*
Cryptotriton necopinus	*Sibon manzanaresi*
Cryptotriton sierraminensis	*Sibon merendonensis*
Cryptotriton veraepacis	*Sibon miskitus*
Cryptotriton xucaneborum	*Sibon noalamina*
Dendrotriton bromeliacius	*Sibon perissostichon*
Dendrotriton chujorum	*Trimetopon gracile*
Dendrotriton cuchumatanus	*Trimetopon slevini*
Dendrotriton kekchiorum	*Trimetopon viquezi*
Dendrotriton rabbi	*Urotheca myersi*
Dendrotriton sanctibarbarus	*Micrurus mosquitensis*
Nototriton abscondens	*Micrurus ruatanus*
Nototriton barbouri	*Micrurus stuarti*
Nototriton brodiei	*Epictia martinezi*
Nototriton costaricense	*Epictia pauldwyeri*
Nototriton gamezi	*Typhlops tycherus*
Nototriton guanacaste	*Atropoides indomitus*
Nototriton lignicola	*Bothriechis guifarroi*
Nototriton limnospectator	*Bothriechis lateralis*
Nototriton major	*Bothriechis marchi*
Nototriton matama	*Bothriechis nigroviridis*
Nototriton mime	*Bothriechis nubestris*
Nototriton nelsoni	*Bothriechis thalassinus*
Nototriton oreadorum	*Cerrophidion sasai*
Nototriton picadoi	*Cerrophidion wilsoni*
Nototriton picucha	*Porthidium porrasi*
Nototriton richardi	*Porthidium volcanicum*
Nototriton saslaya	*Kinosternon angustipons*
Nototriton stuarti	
Priority Two: High Vulnerability Species in Two Physiographic Regions (73)	
Atelopus certus	*Celestus atitlanensis*
Incilius signifer	*Dactyloa ibanezi*
Rhinella centralis	*Dactyloa kunayalae*
Hyalinobatrachium dianae	*Dactyloa maia*
Craugastor aurilegulus	*Dactyloa savagei*
Craugastor campbelli	*Norops aquaticus*
Craugastor charadra	*Norops carpenteri*
Craugastor epochthidius	*Norops charlesmyersi*
Craugastor evanesco	*Norops cryptolimifrons*
Craugastor fecundus	*Norops loveridgei*
Craugastor lauraster	*Norops polylepis*
Craugastor obesus	*Norops wilsoni*
Craugastor pechorum	*Norops zeus*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Craugastor persimilis	*Heloderma charlesbogerti*
Craugastor rostralis	*Ctenosaura melanosterna*
Craugastor rugosus	*Ctenosaura praeocularis*
Craugastor sabrinus	*Ctenosaura quinquecarinata*
Craugastor sandersoni	*Sceloporus lunaei*
Pristimantis altae	*Mesoscincus managuae*
Pristimantis caryophyllaceus	*Lepidoblepharis emberawoundule*
Oophaga granulifera	*Cnemidophorus ruatanus*
Oophaga vicentei	*Dendrophidion crybelum*
Ecnomiohyla bailarina	*Mastigodryas dorsalis*
Ecnomiohyla fimbrimembra	*Tantilla jani*
Ecnomiohyla sukia	*Tantilla taeniata*
Isthmohyla lancasteri	*Geophis ruthveni*
Agalychnis annae	*Ninia pavimentata*
Bolitoglossa alvaradoi	*Rhadinaea sargenti*
Bolitoglossa lignicolor	*Rhadinella montecristi*
Bolitoglossa nympha	*Urotheca pachyura*
Bolitoglossa odonnelli	*Micrurus hippocrepis*
Bolitoglossa salvinii	*Bothriechis supraciliaris*
Cryptotriton nasalis	*Lachesis melanocephala*
Oedipina alfaroi	*Lachesis stenophrys*
Oedipina alleni	*Rhinoclemmys funerea*
Oedipina ignea	
Oedipina stuarti	
Dermophis occidentalis	
Priority Three: High Vulnerability Species in Three Physiographic Regions (27)	
Craugastor chac	*Echinosaura panamensis*
Craugastor gollmeri	*Ctenosaura flavidorsalis*
Craugastor stejnegerianus	*Sceloporus malachiticus*
Pristimantis cerasinus	*Drymobius melanotropis*
Pristimantis pardalis	*Scolecophis atrocinctus*
Silverstoneia flotator	*Dipsas articulata*
Agalychnis saltator	*Dipsas bicolor*
Bolitoglossa schizodactyla	*Rhadinaea vermiculaticeps*
Oedipina pseudouniformis	*Sibon anthracops*
Diploglossus bilobatus	*Sibon carri*
Dactyloa insignis	*Trimetopon barbouri*
Norops lionotus	*Micrurus stewarti*
Norops macrophallus	*Atropoides picadoi*
Norops quaggulus	
Priority Four: High Vulnerability Species in Four Physiographic Regions (21)	
Craugastor megacephalus	*Norops wellbornae*
Craugastor mimus	*Holcosus leptophrys*
Craugastor ranoides	*Holcosus quadralineatus*
Diasporus diastema	*Leptophis nebulosus*
Bolitoglossa colonnea	*Crisantophis nevermanni*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Bolitoglossa dofleini	*Rhadinella anachoreta*
Dactyloa brooksi	*Sibon argus*
Norops apletophallus	*Sibon longifrenis*
Norops elcopeensis	*Micrurus alleni*
Norops humilis	*Agkistrodon howardgloydi*
Norops oxylophus	
Priority Five: High Vulnerability Species in Five Physiographic Regions (9)	
Cochranella granulosa	*Coleonyx mitratus*
Craugastor noblei	*Marisora unimarginata*
Bolitoglossa striatula	*Dendrophidion rufiterminorum*
Gymnopis multiplicata	*Trimorphodon quadruplex*
Basiliscus plumifrons	
Priority Six: High Vulnerability Species in Six Physiographic Regions (3)	
Norops limifrons	*Dendrophidion apharocybe*
Sphaerodactylus millepunctatus	
Priority Seven: Medium Vulnerability Species in Single Physiographic Region (23)	
Atelopus senex	*Plectrohyla pokomchi*
Incilius chompipe	*Plectrohyla quecchi*
Incilius fastidiosus	*Lithobates juliani*
Incilius melanochlorus	*Lithobates taylori*
Rhinella chrysophora	*Bolitoglossa morio*
Isthmohyla angustilineata	*Dactyloa ginaelisae*
Isthmohyla graceae	*Norops cobanensis*
Isthmohyla pseudopuma	*Ninia psephota*
Ithmohyla rivularis	*Rhadinaea stadelmani*
Isthmohyla tica	*Rhadinella hempsteadae*
Plectrohyla chrysopleura	*Rhadinella serperaster*
Plectrohyla glandulosa	
Priority Eight: Medium Vulnerability Species in Two Physiographic Regions (21)	
Atelopus zeteki	*Norops mccraniei*
Incilius ibarrai	*Lepidophyma mayae*
Incilius leucomyos	*Lepidophyma reticulatum*
Craugastor bransfordii	*Helminthophis frontalis*
Atlantihyla panchoi	*Tantilla brevicauda*
Atlantihyla spinipollex	*Tantilla excelsa*
Duellmanohyla salvadorensis	*Geophis tectus*
Duellmanohyla salvavida	*Trimetopon pliolepis*
Duellmanohyla soralia	*Trimetopon simile*
Duellmanohyla uranochroa	*Amerotyphlops stadelmani*
Hyloscirtus colymba	
Priority Nine: Medium Vulnerability Species in Three Physiographic Regions (5)	
Atelopus varius	*Tantilla ruficeps*
Craugastor laevissimus	*Geophis brachycephalus*
Ptychohyla hypomykter	
Priority Ten: Medium Vulnerability Species in Four Physiographic Regions (4)	
Lithobates warszewitschii	*Tantilla armillata*

Table 10 (continued). Conservation priority listing of the endemic herpetofaunal species in Central America based on the EVS categorization and the range of physiographic occurrence.

Leptodrymus pulcherrimus	*Amerotyphlops costaricensis*
Priority Eleven: Medium Vulnerability Species in Five Physiographic Regions (4)	
Mastigodryas alternatus	*Urotheca guentheri*
Ninia maculate	*Epictia ater*
Priority Twelve: Medium Vulnerability Species in Six Physiographic Regions (2)	
Norops cupreus	*Geophis hoffmanni*
Priority Thirteen: Medium Vulnerability Species in Seven Physiographic Regions (1)	
Hydromorphus concolor	
Priority Fourteen: Medium Vulnerability Species in Eight Physiographic Regions (1)	
Leptodeira rhombifera	

Plate 28. *Dactyloa insignis* (Cope, 1871). The Decorated Anole is a priority four species with an EVS of 14, with a distribution restricted to "the Cordillera Tilarán and Cordillera Central of Costa Rica" (Poe and Ryan 2017: 6). This individual was encountered in Estación Pocosol, Bosque Eterno de los Niños, in the province of Alajuela, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 30. *Norops carpenteri* (Echelle, Echelle, and Fitch, 1971). Carpenter's Anole is a priority two species with an EVS of 16, distributed "on the Atlantic versant from northeastern Honduras to northwestern Panama" (McCranie and Köhler 2015: 45). This individual was found in Reserva El Copal, Jiménez, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 29. *Dactyloa kunayalae* (Huleback, Poe, Ibáñez, and Williams, 2007). This anole is a priority two species with an EVS of 15, restricted in distribution to "central Panama" (Köhler 2008: 100). This individual came from Parque Nacional General de División Omar Torrijos Herrera, in the province of Coclé, Panama. *Photo by Abel Batista.*

Plate 31. *Norops kemptoni* (Dunn, 1940). Kempton's Anole is a priority one species with an EVS of 15, found in the "highlands of Chiriquí, Panama" (Köhler 2008: 106). This individual is from Alto Chiquero, Parque Nacional Volcán Barú, in the province of Chiriquí, Panama. *Photo by Javier Sunyer.*

Plate 32. *Coleonyx mitratus* (Peters, 1863). The Central American Banded Gecko is a priority six species with an EVS of 14, which ranges along the "Atlantic lowlands of northeastern Guatemala and northwestern Honduras [and the] Pacific lowlands from Guatemala to southwestern Costa Rica" (Savage 2002: 482). This individual was located in Sector Santa Rosa, Parque Nacional Santa Rosa, in the province of, Guanacaste, Costa Rica. P*hoto by Víctor Acosta-Chaves.*

Plate 34. *Sceloporus malachiticus* Cope, 1864. The Green Spiny Lizard is a priority three species with an EVS of 10, distributed from "El Salvador and Honduras across Nicaragua and Costa Rica to Panama" (Köhler 2008: 152). This individual was encountered in Cerro de la Muerte, in the province of San José, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 36. *Rhadinaea calligaster* (Cope, 1876). The Thick Graceful Brownsnake is a priority one species with an EVS of 14, distributed in "the Cordillera de Tilarán, Cordillera Central, and Cordillera de Talamanca of Costa Rica and on Volcán Tenorio in the Cordillera de Guanacaste…to extreme western Panama" (Savage 20002: 623). This individual came from San Gerardo de Dota, in the province of San José, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 33. *Heloderma charlesbogerti* Campbell and Vanini, 1988. The Guatemalan Beaded Lizard is a priority two species that inhabits "the Río Motagua Valley, in the Atlantic versant of eastern Guatemala" (Reiserer et al. 2013: 81). This individual was found at Cabañas, in the department of Zacapa, Guatemala. *Photo by Andres Novales.*

Plate 35. *Scolecophis atrocinctus* (Schlegel, 1837). priority three species with an EVS of 13, which ranges along the "Pacific versant from southeastern Guatemala to northwestern Costa Rica; the species also is found on the Atlantic versant in southwestern Honduras, western Nicaragua, and northwestern Costa Rica" (Wilson and Mata-Silva 2015: 422). This individual was found in Tilarán, in the province of Guanacaste, Costa Rica. *Photo by Víctor Acosta-Chaves.*

Plate 37. *Bothriechis lateralis* Peters, 1862. The Coffee Palmviper is a priority one species with an EVS of 16. distributed in "the cordilleras of Costa Rica and western Panama (Savage, 2002: 724). This individual came from La Nevera, Serranía de Tabasará, Panama. *Photo by Abel Batista.*

F. The Central American endemic herpetofauna is distributed unevenly among the 10 physiographic regions we recognize in this portion of Mesoamerica. The number of endemic species in these regions ranges from six in the Yucatan Platform to 254 in the Isthmian Central American highlands. Most of the 623 endemic species are limited to a single physiographic region, i.e., 450 (72.2%). The next largest number of 95(15.2%) is for those occupying two regions. Thus, 545 (87.5%) of the species occur in only one or two of the 10 regions.

G. An implementation of the EVS system of conservation assessment demonstrates that all of the scores for the 623 endemic species in Central America lie within the medium vulnerability (63) or high vulnerability (560) categories.

H. We used the same means as Johnson et al. (2017) for the Mexican endemic species to prioritize the conservation significance of the Central American endemic species, i.e., by combining the data on physiographic distribution with that on EVS. This procedure allowed us to identify 14 priority levels, of which six are high vulnerability and eight are medium vulnerability groupings.

I. The number of species occupying the six high vulnerability levels decrease markedly and consistently from 429 in Priority Level One (high vulnerability species occupying a single physiographic region) to one in Priority Level Six (high vulnerability species occurring in six physiographic regions. The total number of species allocated to the seven priority levels amounts to 562, 90.2% of the 623 Central American endemic species.

J. The number of species occurring in the eight medium vulnerability levels also decreases consistently, but not as markedly, from 23 in Priority Level Seven (medium vulnerability species occupying single physiographic regions) to one in Priority Level Fourteen (medium vulnerability species distributed in eight physiographic regions). The total number of species placed in these eight priority levels is 61, 9.8% of the total number of Central American endemics.

K. Our analysis demonstrates that most Central American endemic species are assessed as high vulnerability species that occupy only one or two physiographic regions. A significant number of species (44) are of medium vulnerability, and they also inhabit one or two physiographic regions.

L. Protecting the endemic component of the globally significant Central American herpetofauna represents the most significant challenge for conservation professionals working in this portion of Mesoamerica.

M. One of the conclusions of the conservation analyses we have conducted in recent years, including in this paper, is that perpetual protection of the Mesoamerican herpetofauna presently is a goal far from realization. Our prognosis is that this goal will not be attained until humans are willing to address the widespread problems created by the anthropocentric worldview, and the impediment it represents for allowing the environment "to function indefinitely without going into a decline from the stresses imposed by human society on natural systems such as fertile soil, water, and air" (Raven and Berg 2004: G-15).

N. If there is any merit to our hypothesis that anthropocentrism is part of a cascade of psychological ailments, which extend through ethnocentrism and culminate in the narcissistic personality disorder, it might predict that the critical-thinking educational reform called for by Johnson et al. (2017) will have to be recognized as requiring species-wide psychotherapy to treat a species-wide mental disease. If so, addressing this disease will be the largest problem undertaken by humanity during its existence on planet Earth.

Recommendations

A. The recommendations presented in the Johnson et al. (2017: 616) study on the Mexican endemic herpetofauna dealt with the establishment of a global coalition "to document all of Earth's inhabitants within the 21st century, and to provide for their perpetual protection." This recommendation applies here as well.

B. Johnson et al. (2017) also recommended that the system of prioritization they developed could help determine how funding for a countrywide system of sustainable reserves could be best utilized to protect the Mexican endemic herpetofauna. The same can be said for the Central American endemic herpetofauna, with respect to the seven nations comprising this region of the world.

C. We propose that until such steps are taken, the Central American endemic herpetofauna, as well as the entire planetary biota, will become a casualty of anthropocentrism. Nonetheless, these steps only will constitute stopgap measures, as the underlying anthropocentric worldview held by most humans will continue to accelerate the degradation of the planetary life-support systems, and eventually will render the planet unsuitable to support life.

"... Each loss of a species is a loss of a companion on the long journey of evolution ..."

—David W. Orr (2016).

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Plate 38. *Bothriechis nigroviridis* Peters, 1859. The Black-speckled Palm-pitviper is a priority one species with an EVS of 17, which ranges along "the cordilleras of Costa Rica and western Panama" (Savage, 2002: 725). This individual was found at Jurutungo, in the province of Chiriquí, Panama. *Photo by Javier Sunyer.*

Plate 39. *Lachesis stenophrys* Cope, 1875. The Central American Bushmaster is a priority two species with an EVS of 17, distributed from "southeastern Nicaragua to central Panama" (Köhler 2008: 330). This individual came from Parque Nacional Braulio Carrillo, in the province of Heredia, Costa Rica. *Photo by César Barrio-Amorós.*

Plate 40. *Porthidium porrasi* Lamar, 2003. The White-tailed Hog-nosed Pitviper is a priority one species with an EVS of 18, with a distribution restricted to the Península de Osa and adjacent areas of southwestern Costa Rica (Solórzano 2004). Pictured here is an individual from this region, in the province of Puntarenas, Costa Rica. *Photo by César Barrio-Amorós, courtesy of Roel de Plecker.*

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Addendum (changes past conclusion of analyses)

We chose a cut-off date of 30 April 2018 to discontinue revising the huge number of calculations dealing with the 623 endemic herpetofaunal species documented in Central America. Past this date, we added pertinent taxa and publications to this addendum until the correction of the proof, as follows:

(1) *Craugastor aenigmaticus*. Arias et al. (2018) described this new species of rainfrog from the Cordillera de Talamanca in southern Costa Rica. This frog is known from several localities in montane rainforest, and its EVS can be calculated as 5+8+4=17, placing it in the middle portion of the high vulnerability category. This species is limited to a single physiographic region, the Isthmian Central American highlands, and can be placed in conservation priority level one.

(2) *Craugastor castanedai.* McCranie (2018) described this new species of rainfrog from the Parque Nacional Pico Bonito in north-central Honduras. This frog is known from only two localities on either side of the Quebrada de Oro, and its EVS can be calculated as 6+8+4=18, placing it in the upper portion of the high vulnerability category. This species is limited to a single physiographic region, the eastern nuclear Central American highlands, and can be placed in conservation priority level one.

(3) *Craugastor gutschei.* McCranie (2018) also described this new species of rainfrog from the western portion of the Cordillera Nombre de Dios in north-central Honduras. Its EVS can be calculated as 5+7+4=16, placing it in the middle portion of the high vulnerability category. This species is restricted to the eastern nuclear Central American highlands, and can be allocated to conservation priority level one.

(4) *Hemiphractus elioti.* Hill et al. (2018) described this new species of horned frog from the Cordillera de Talamanca in western Panama. Its EVS can be determined as 5+7+5=17, placing it in the middle portion of the high vulnerability category. This species is restricted to the Isthmian Central American highlands, and can be allocated to conservation priority level one.

(5) *Hemiphractus kaylockae.* Hill et al. (2018) named this new species of horned frog from the highlands of eastern Panama. Its EVS can be estimated as 6+8+5=19, placing it in the upper portion of the high vulnerability category. This species is restricted to the eastern Panamanian highlands, and can be placed in conservation priority level one.

(6) *Hemiphractus panamensis*. Hill et al. (2018) revalidated this taxon of horned frogs from the eastern highlands of Panama. Its EVS can be determined as 5+8+5=18, placing it in the upper portion of the high vulnerability category. This species is restricted to the western portion of the eastern Panamanian highlands in the central portion of the country, and can be placed in conservation priority level one.

(7) *Hemiphractus fasciatus*. Hill et al. (2018) determined that this species, formerly considered to be the single representative of this peculiar hylid genus in Central America, should be considered to be a South American taxon not resident in Panama.

(8) *Norops caceresae*. Hofmann and Townsend (2018) described this anole from the Lenca highlands of southwestern Honduras. Its EVS can be estimated as 5+7+3=15, placing in the lower portion of the high vulnerability category. This species is limited to the eastern nuclear Central American highlands, and can be placed in conservation priority level one.

(9) *Rhadinella xerophila*. Ariano-Sánchez and Campbell (2018) described this dipsadid snake from dry forest and thorn scrub of the Valle del Motagua, Guatemala. Its EVS can be calculated as 6+8+2=16, placing it in the middle portion of the high vulnerability category. This species is restricted to a single physiographic region, the Caribbean lowlands of eastern Guatemala and northern Honduras, and can be placed in conservation priority level one.

(10) The genera *Coloptychon* and *Gerrhonotus*. García-Vázquez et al. (2018), in a paper on the molecular systematics and historical biogeography of the anguid genus *Gerrhonotus*, left open a number of taxonomic questions about the alligator lizards, but at least seemed to conclude that the monotypic genus *Coloptychon* (and its species *rhombifer*) should be returned to the genus *Gerrhonotus*. The genus *Coloptychon* has had a history of wobbling between recognition as distinct or not from *Gerrhonotus* over the course of its 142-year history. In this addendum, we follow the decision of García-Vázquez et al. (2018).

Vicente Mata-Silva is a herpetologist originally from Río Grande, Oaxaca, Mexico. His interests include ecology, conservation, natural history, and biogeography of the herpetofaunas of Mexico, Central America, and the southwestern United States. He received his B.S. degree from the Universidad Nacional Autónoma de México (UNAM), and his M.S. and Ph.D. degrees from the University of Texas at El Paso (UTEP). Vicente is an Assistant Professor of Biological Sciences at UTEP in the Ecology and Evolutionary Biology Program, and Assistant Director of UTEP's 40,000 acre Indio Mountains Research Station, located in the Chihuahuan Desert of Trans-Pecos, Texas. To date, Vicente has authored or co-authored over 100 peer-reviewed scientific publications. He also was the Distribution Notes Section Editor for the journal *Mesoamerican Herpetology*.

Dominic L. DeSantis is currently a Ph.D. candidate and National Science Foundation-Graduate Research Fellow at the University of Texas at El Paso. He received his Bachelor's degree at Texas State University where he also completed multiple research projects on the antipredator behavior of the critically endangered Barton Springs Salamander (*Eurycea sosorum*). His ongoing dissertation research integrates multiple field monitoring technologies to study snake movement and behavioral ecology. Dominic accompanied Vicente Mata-Silva, Elí García-Padilla, and Larry David Wilson on survey and collecting trips to Oaxaca in 2015, 2016, and 2017 and is a co-author on numerous natural history publications produced from those visits, including an invited book chapter entitled: "Conservation of Herpetofauna in Disturbed Habitats: Perspectives from Short-term Surveys in the Sierra Madre del Sur, Oaxaca, Mexico." Overall, Dominic has co-authored over 50 peer-reviewed scientific publications.

Elí García-Padilla is a herpetologist primarily focused on the study of the ecology and natural history of the Mexican herpetofauna. His research efforts have centered on the Mexican states of Baja California, Tamaulipas, Chiapas, and Oaxaca. His first experience in the field was researching the ecology of the insular endemic populations of the rattlesnakes *Crotalus catalinensis*, *C. muertensis* (now allocated to *C. pyrrhus*) and *C. tortugensis* (now allocated to *C. atrox*) in the Gulf of California. For his Bachelor's degree he presented a thesis on the ecology of *C. muertensis* (now allocated to *C. pyrrhus*) on Isla El Muerto, Baja California, Mexico. To date, he has authored or co-authored over 75 peer-reviewed scientific publications. Currently, he is employed as a formal Curator of Amphibians and Reptiles from Mexico in the electronic platform "Naturalista" of the Comisión Nacional para el Uso y Conocimiento de la Biodiversidad (CONABIO; www.naturalista.mx). One of his main passions is environmental education, and for several years he has been working on a variety of projects that include the use of audiovisual media as a powerful tool to reach large audiences and to promote the importance of the knowledge, protection, and conservation of biodiversity in Mexico. Elí's interests include wildlife and conservation photography, and his art has been published in several recognized scientific, artistic, and educational books, magazines, and websites. Presently, he is collaborating on a research project evaluating the Jaguar (*Panthera onca*) as an umbrella species for the conservation of the herpetofauna of Nuclear Central America.

Jerry D. Johnson is Professor of Biological Sciences at The University of Texas at El Paso, and has extensive experience studying the herpetofauna of Mesoamerica, especially that of southern Mexico. Jerry is the Director of the 40,000-acre "Indio Mountains Research Station," was a co-editor on *Conservation of Mesoamerican Amphibians and Reptiles* and co-author of four of its chapters, co-editor of *Mesoamerican Herpetology: Systematics, Zoogeography, and Conservation*, and co-author of *Middle American Herpetology: A Bibliographic Checklist*. He also is the senior author of the recent paper "A conservation reassessment of the Central American herpetofauna based on the EVS measure" and is Mesoamerica/Caribbean editor for Geographic Distribution section of *Herpetological Review*. Johnson has authored or co-authored over 120 peer-reviewed papers, including other studies on the conservation status of the Mesoamerican herpeteofauna. One species, *Tantilla johnsoni*, has been named in his honor. For several years, he was an Associate Editor and Co-chair of the Taxonomic Board for the journal *Mesoamerican Herpetology*.

Larry David Wilson is a herpetologist with lengthy experience in Mesoamerica. He was born in Taylorville, Illinois, United States, and received his university education at the University of Illinois at Champaign-Urbana (B.S. degree) and at Louisiana State University in Baton Rouge (M.S. and Ph.D. degrees). He has authored or co-authored over 400 peer-reviewed papers and books on herpetology, including numerous papers on the conservation status of Mesoamerica and its constituent parts. Larry is the senior editor of *Conservation of Mesoamerican Amphibians and Reptiles* and the co-author of seven of its 21 chapters. His other books include *The Snakes of Honduras*, *Middle American Herpetology*, *The Amphibians of Honduras, Amphibians & Reptiles of the Bay Islands and Cayos Cochinos, Honduras, The Amphibians and Reptiles of the Honduran Mosquitia*, and *Guide to the Amphibians & Reptiles of Cusuco National Park, Honduras*. To date, he has authored or co-authored the descriptions of 71 currently recognized herpetofaunal species, and seven species have been named in his honor, including the anuran *Craugastor lauraster*, the lizard *Norops wilsoni*, and the snakes *Oxybelis wilsoni*, *Myriopholis wilsoni*, and *Cerrophidion wilsoni*. For several years, Larry was an Associate Editor and Co-chair of the Taxonomic Board for the journal *Mesoamerican Herpetology*.